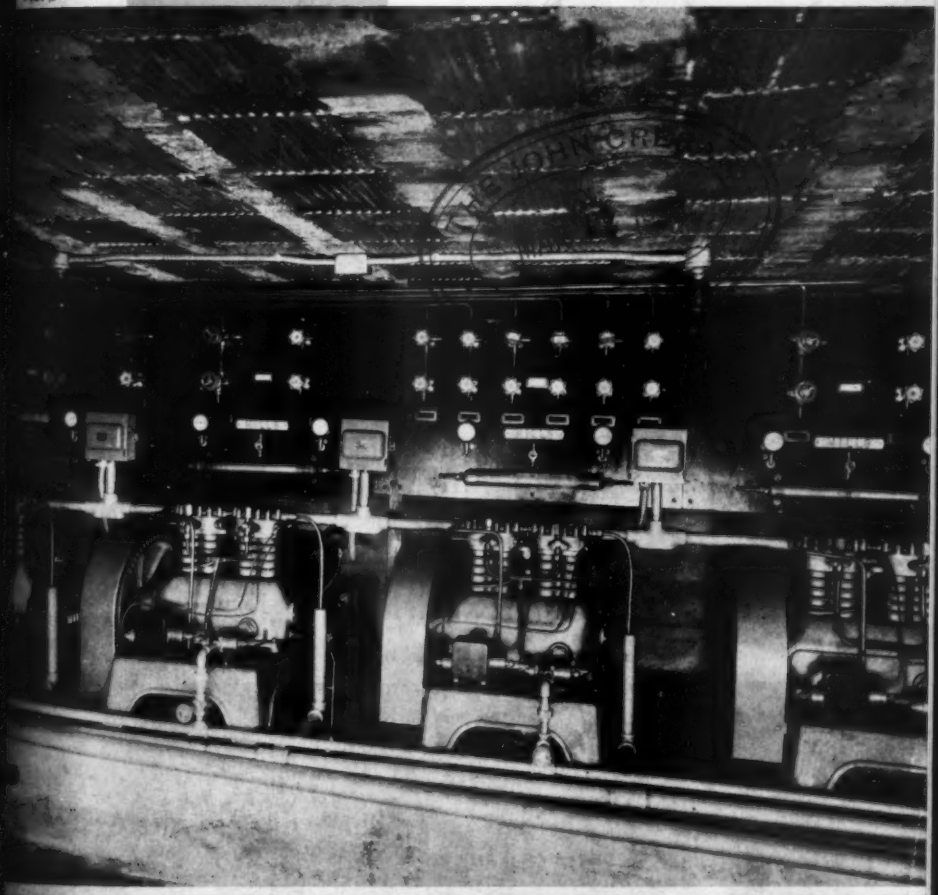
The Refrigeration Service Engineer

Vol. 6
No. 3

MARCH • 1938



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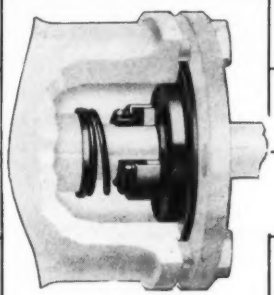

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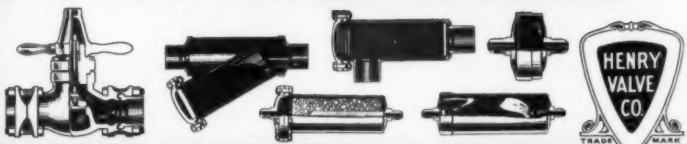

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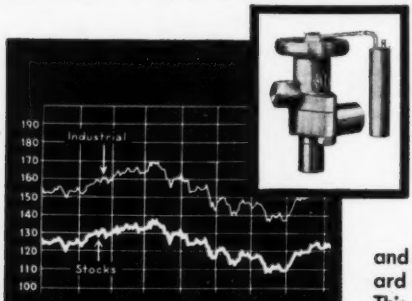
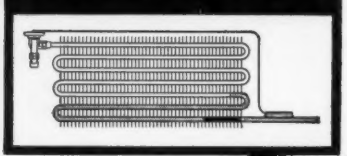


Interesting to a market trader, but zig-zag lines are wasteful when you chart refrigerant flow.



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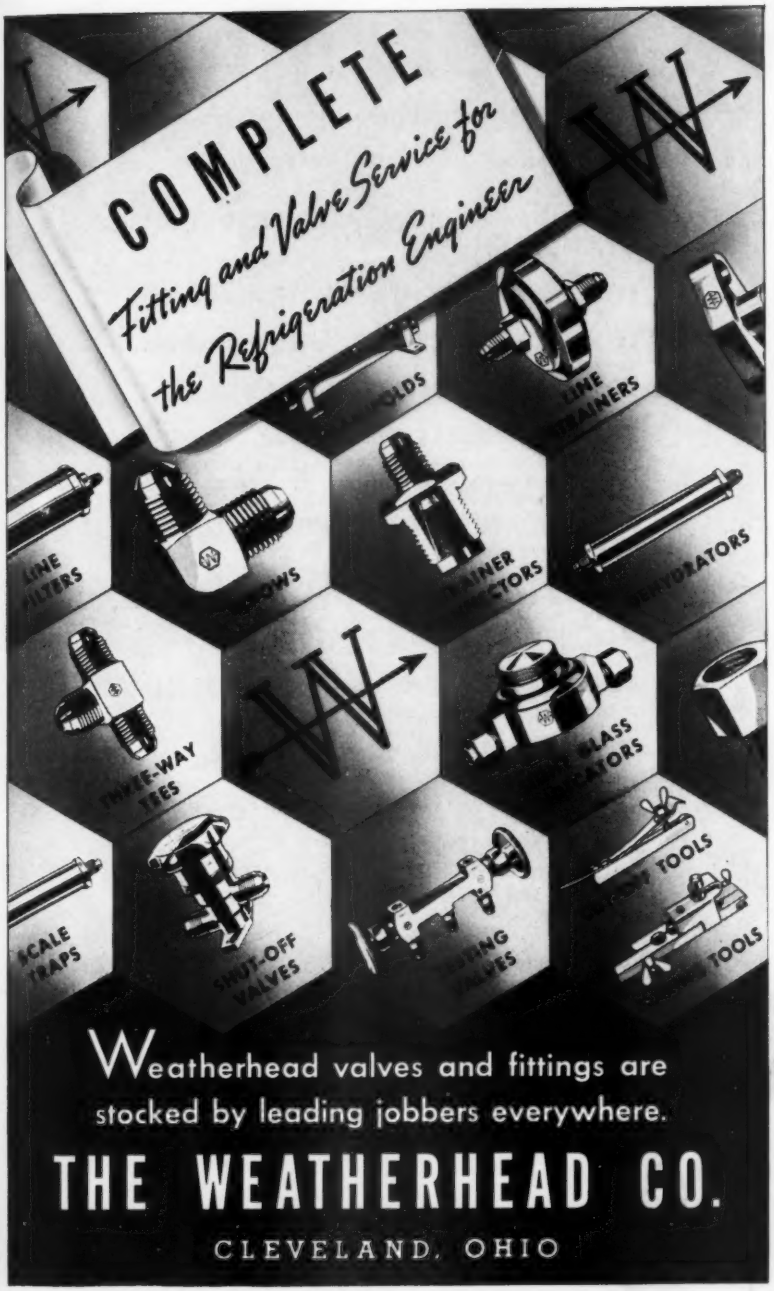

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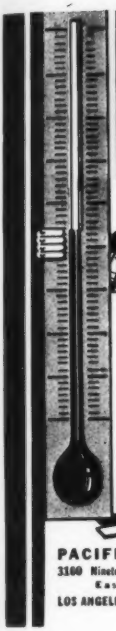

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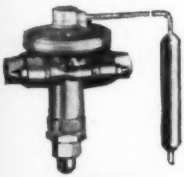

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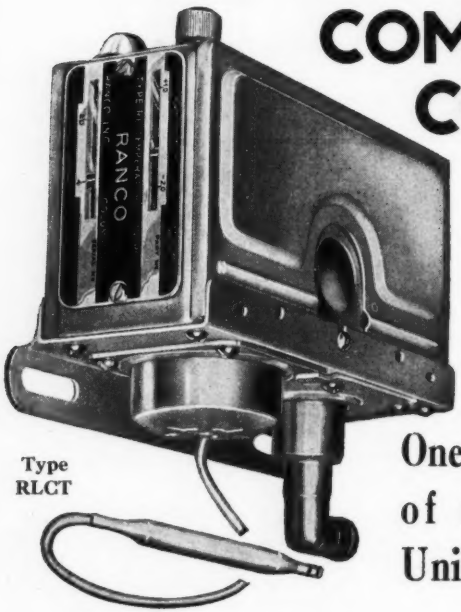

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The Refrigeration Service Engineer

Vol. 6 No. 3

March, 1938

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners

Official Organ
REFRIGERATION SERVICE ENGINEERS SOCIETY

Cover

This month's cover shows a line-up of four-cylinder, three-horsepower Mills condensing units which are part of a locker storage plant in Waupun, Wisconsin. Note the neat arrangement of the panel board, back of the machines. All evaporating coils are cross-connected so that the load of any one may be transferred to another machine. See Article on page 13.

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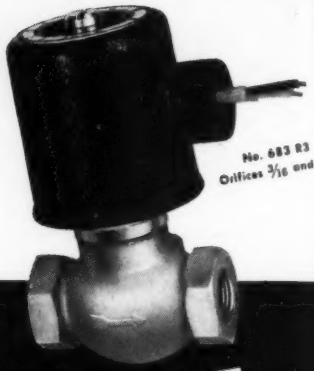

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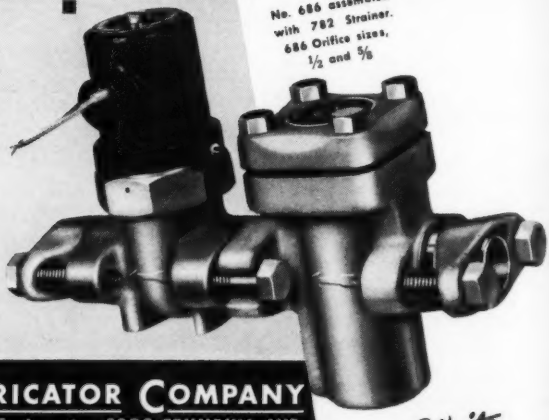

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The Refrigeration Service Engineer

VOL. 6, No. 3 CHICAGO, MARCH, 1938 $2.00 Per Annum

Purging Operations

Ammonia, Sulphur Dioxide and Methyl Chloride Systems

By L. K. WRIGHT, M.E.

REFRIGERATING systems containing air do not operate efficiently. They have to run longer and consume more electricity to produce the same cooling effect than if cleared of air. Thus, air in systems is undesirable, as it brings about an increase in head pressure, due to its occupying space in the condenser and lowering the rate of heat transfer.

Again, increase in head pressure renders a compressor less efficient and it must be operated for a longer period of time to equal the work done where no air and less head pressure results.

Air, even in the middle of the Sahara, contains moisture. In methyl chloride, isobutane and F-12 systems, the moisture will freeze out in the throttle device (i.e., at the opening in a low side float valve, expansion valve, or in a capillary tube, etc.). Bear in mind the minuteness of the opening in any throttle device. A half of a drop of water is more tnan sufficient to bring about cessation of refrigeration in any small commercial or household system.

Ammonia systems are not subject to water freezing out at the throttle.

Where sulphur dioxide is the refrigerant serious damage may result if moisture enters the system, for the water will combine with refrigerant to form sulphurous acid. This acid attacks the bright steel surfaces, such as pistons, rings, valves and seats, wrist pins, etc. and results in the well-known "stuck-up" condition; that is, the resulting chemical compound jams the moving parts and in many instances so badly that there is no recovery value.

Checking Head Pressures

The service man or inspector should check operating conditions by taking the back pressure, head pressure and ambient condenser conditions. By the use of the head pressure chart correct head pressure for a similar back pressure and room temperature can be ascertained. If the machine head pressure is in excess of that indicated on the chart the condenser should be checked and cleaned of dirt or dust. The fan should be checked for broken or bent blades. A partially open liquid shut-off valve, pinched or dented liquid line, clogged strainer or overcharge will give high head pressure readings.

As a rule high head pressure will be traceable to air in the system and its removal is one of the simplest of service operations and at the same time one which requires extreme care.

While purging of this entrapped air can be accomplished by blowing directly out to the atmosphere the worker is obliged to guess when all air has been expelled. In

order to make certain he usually over-purges, allowing refrigerant to unnecessarily escape, representing a distinct loss.

It is best to purge by the visual method as outlined below.

Purging Ammonia

Water has a great affinity for ammonia vapor and when cold will unite with great volumes of ammonia. For instance, at 60 degrees F. and normal atmosphere pressure, one lb. of water will take up about .6 lb. of ammonia. This amount of ammonia in gas form at normal atmospheric pressure and 60 degrees F. occupies about 2,850 cu. in. of space. One pound of water displaces about 27.5 cu. in. Roughly, one cu. in. of water assimilates or absorbs 104 cu. in. of ammonia gas, or one quart of water will take up 500 quarts of ammonia gas.

Before beginning the purging action the unit should be stopped and water allowed to pass over the condenser for ten minutes by blocking open the water valve.

The purge cock should be cracked open carefully so that a steady stream of gases reaches the purge pail. As ammonia will be absorbed by the cold water the bubbles which rise and reach the top are air. If the purge valve is opened too wide, water will be blown out of the pail or the tube itself ejected. The purge valve must be cracked just enough to produce a steady stream of bubbles. The danger lies also in not opening the valve enough, for if the valve is cracked too slightly there will be a "suck-back" of water into the system. The check valve described later is recommended to prevent this.

By watching the escaping stream of bubbles the operator can determine if all air has been removed. Air will not be absorbed by the water and these bubbles will rise and break upon reaching the surface. Pure ammonia gas bubbles will be large at the time of leaving the hose end and will grow smaller and smaller as the gas is absorbed by the water, vanishing entirely before reaching the surface, unless the purge valve has been opened too wide. Fig. 1, diagrammatically illustrates this action.

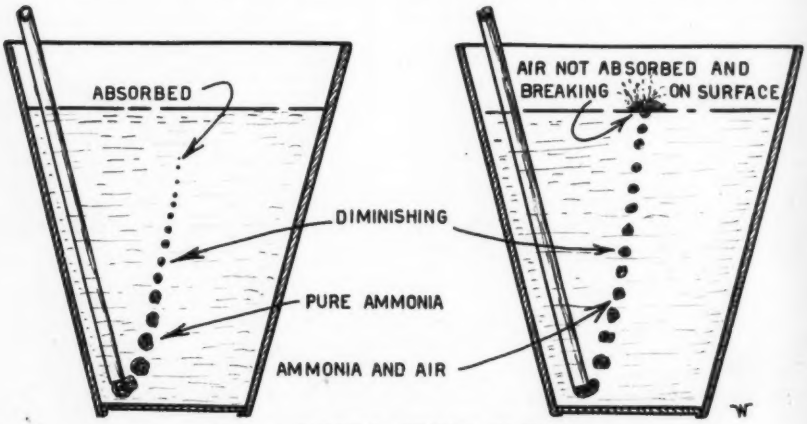


FIG. 1. PURGING AMMONIA IN WATER.

In order to prevent any odor of ammonia the worker should bubble the entrapped air from the system through water. The ammonia will thus be absorbed, while the air will escape.

It is important to remember that ammonia or sulphur dioxide fumes destroy plants and pets and will ruin fabrics by fading or changing the colors. Proper purging will be odorless and not endanger pets or plants.

To purge ammonia, a rubber tube is attached to the purge cock at the top of the condenser. The end of the hose should be held under the water in the purging pail by means of a stone or iron weight to prevent it from being blown out.

If a great quantity of air is present or where a system must be relieved of some ammonia it may be necessary to stop purging when the water in the pail becomes odorous and replace with fresh cold water. Use care to prevent the ammonia water in the

pail from getting on varnish or painted surfaces as it will remove the finish.

As soon as only pure ammonia gas is escaping there is a tendency for a snapping or knocking sound to develop. This is a good point to watch for and observe cautiously, for at this point the water is liable to be sucked up into the tube or even the system itself.

Sulphur Dioxide Systems

Sulphur dioxide is deadly to plants and pets, even in small quantities. It will discolor some rugs, silks, fabrics, etc. and any noticeable odor may be taken as indicative of incorrect purging technique.

To purge a sulphur dioxide system, first stop the motor. If a water-cooled unit is involved block the water switch and allow the condenser to be cooled for ten minutes before proceeding. Where the system is of the air-cooled type, remove the belt and let the motor run. If of the direct-driven type the unit can be stopped and a fan placed so as to cool the condenser.

While it is true that mixtures of gases (air and sulphur dioxide, for instance) do not separate if left to rest, it is best to cool the condensers of refrigeration systems and allow to rest for a short period.

Air itself is a mixture of gases and yet resting will not cause separation. An excellent means of demonstrating this non-separation is to allow some bromine vapor to enter a large test tube filled with air and to cork or seal the mixture. Bromine gas is over five times heavier than air and yet it will be observed that a uniform mixture results, the even color showing this up very nicely.

In refrigeration apparatus, however, the cooling action will result in the condensation of some of the refrigerant, the excess pressure aiding in this condensation.

Sulphur dioxide must be purged into lye water. One pound of sulphur dioxide will be taken up by 1.28 pounds of lye. Ordinary household lye is sold in 14 oz. cans and if an entire system is to be evacuated of its charge the correct amount of lye can be purchased for the job.

Lye water is very corrosive. Do not use a galvanized pail for a container as it will eat away the zinc lining. An aluminum vessel will be destroyed within a few minutes and must never be used. Ceramic, agate, granite ware, fibre or iron pails are suitable, the granite ware or iron pails being best.

The best pail for purging use is one about 8 to 10 inches in diameter by 18 to 20 inches high. Fill such a vessel ½ to ⅔ with lye water. Never fill more than ⅔ as splashing of the strong caustic neutralizing solution must be guarded against.

In order to safeguard floor finishes use a rubber cloth and place the purging pail in the center of it. Rugs, furniture, floor finishes, etc., will be damaged by accidental spilling of the strong lye solution through carelessness of the operator or by splashing from the receptacle because the valve was opened too wide or too suddenly.

A special purging line can be made by taking a piece of ¼" copper tubing and closing one end. The closed end should be bent to form a 4 to 5 inch ring and a number of 1/32" holes drilled in the ring section. This drilled ring should be bent at right angles, as shown in Sketch 2, so the ring lies flush with bottom. If the worker intends to work on ammonia apparatus steel tubing should be employed in place of copper. Use copper for all other refrigerants.

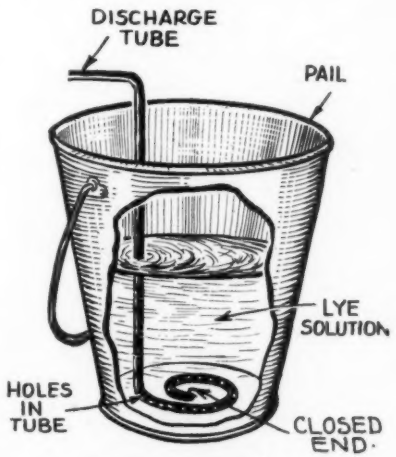


FIG. 2. PURGING SULPHUR DIOXIDE IN LYE SOLUTION.

Care in Purging

Purging appears a simple process. However, a great deal of apparatus has been ruined and much unnecessary labor expended, due to incorrect purging.

If the purge valve or purge port is opened too rapidly solution or the tube may be blown out of the pail, or gas will flood the place. The purging must be of such rate that the bubbles rise steadily and are sep-

arated from one another, so that the refrigerant can be absorbed and removed, permitting the air to rise and escape. Where the purge valve is opened excessively the oil may foam and be evacuated with air and refrigerant.

In all systems which are or have been operating, air will be found in the condensers, regardless of original point of entry.

High side float systems must be purged at two points, as air will be found to exist not only in the condenser but in the dome

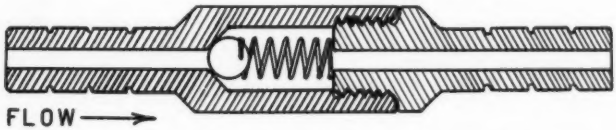


FIG. 3. SHOWING THE TYPE CHECK VALVE TO BE USED IN PURGING LINE.

Where the worker becomes too cautious a suck-back may result; that is, the purging solution will be drawn up into the tube and even into the system. This has occurred even where high pressures would be thought to be a positive barrier to this sort of thing.

A check valve is a splendid thing to use to prevent this possibility. Use an ordinary spring loaded ball check valve, such as is purchaseable in hardware and automobile supply stores. If the ball is of steel, replace with a stainless steel ball or one of hard rubber or Bakelite. Where a lathe and time is available the worker can make up his own check valve of hard rubber or Bakelite which is suitable for use on any refrigerant and being non-corrosive, one which will last a life-time. This design is shown in Fig. 3.

Purging Methyl Chloride, F-12 and Isobutane Systems

While methyl chloride, F-12, and Isobutane can be blown off directly to the air, the worker does not know when correct purging has been secured. Of course he can get the system into operation and check the head pressure, repeating his purging if it remains high.

Methyl chloride, ethyl chloride, F-12 and Isobutane vapors are absorbed by carbon tetrachloride and if purged through this liquid the worker can judge to a nicety when all air is evacuated, just as outlined for ammonia or sulphur dioxide.

Some workers tap the condensers gently while purging, contending it tends to release air bubbles trapped between oil or refrigerant liquid droplets in the tubes.

Where methyl chloride containing acrolein as a warning indicator for leaks is encountered the system may be evacuated by passing the gas through a 5% sodium bisulphite solution to remove the acrolein.

of the high side float as well. High side floats for this reason are usually designed with a purge port or plug in the dome. On some old models in which the designers did not include a purge port or plug, purging of the high side float can be effected by loosening the bolts on the top plate slightly.

"FINEST" SMALL TOWN LIBRARY PRESERVES BOOKS FROM CRACKING IN AIR CONDITIONED BUILDING

YEAR 'round air conditioning has been installed in the David A. Howe Memorial Library at Wellsville, N. Y. for the comfort of readers and staff as well as to preserve rare and valuable books from dirt and improper winter humidity conditions.

Termed "the finest small town library in the United States," this modern building has been erected and equipped with the accumulated income over a ten-year period from the $1,250,000 estate of the late David A. Howe, former publisher and art patron.

The interior of the two-story building is equipped with the latest in library furnishings including all devices for efficiency and comfort. A Carrier all-season air conditioning system serves the basement, and first and second floors. Summer refrigeration is furnished with water from a well under the library building.

A featured use of air conditioning is in the preservation of old books, many of which have become rare and valuable through age. Librarians found there was less tendency for pages of these books to "crack" and deteriorate in an air conditioned, dust-free room. Dirt and dry air were found to be important causes of paper deterioration.

Refrigerated Locker Plants

By GLEN REYNOLDS *

A NEW industry, that of renting cold storage lockers to individuals for the purpose of preserving fresh meats, poultry, fruits and vegetables, is rapidly spreading over the United States. Starting on the West Coast several years ago, this new industry has spread eastward and at the present it is reported there are at least one thousand plants in the United States.

The first cold storage locker plants in Iowa, Minnesota, Illinois and Wisconsin were installed in 1935.

The purpose of these plants is to provide frozen storage to individuals for the storage of food products and to furnish chilling and processing service for fresh killed meats and poultry, fruits and vegetables.

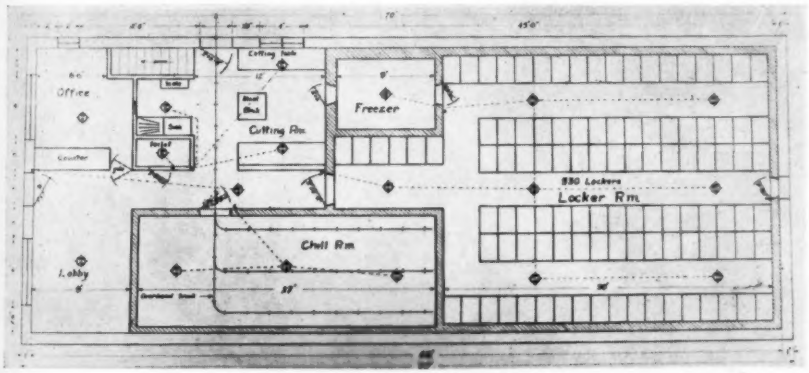
Savings effected by the use of a locker has been reported by some writers to be from $100.00 to $200.00 annually to the consumer.

The usual charge is $10.00 per year or $1.00 per month for the rental of the lockers and in addition there is a charge of from one half to two cents per pound for cutting, wrapping, sharp freezing and placing in the lockers.

Freezing of vegetables is usually accomplished by blanching the product in boiling water from one to eight minutes, then cooled as soon as possible, (preferably in cold water) then sharp freezing same in glass or paste board containers.

Fish and poultry are stored with best results by taking them out of the sharp freezer, dipping in cold water and refreezing. This process is called glazing, as it covers the produce with a thin film of ice which isolates it from the air, thus preventing oxidization and drying out. Some operators claim fatty meats should not be stored more than six months as off-flavors or rancidity start at about that length of time. This condition can be prevented by glazing as above.

The following views are of The Frigid Locker Storage Co. plant at Waupun, Wisc. The plant has a capacity of 740 lockers with additional space for future expansion.



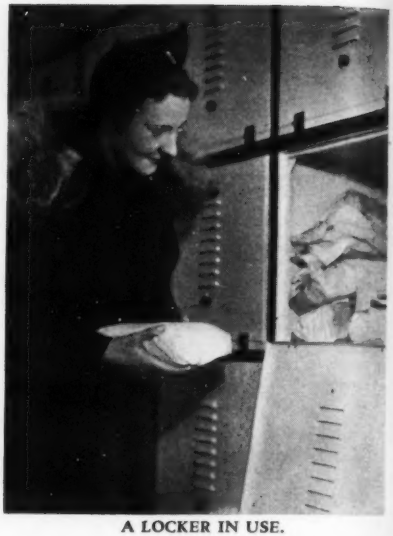
A TYPICAL LAYOUT OF A LOCKER PLANT OF 550 LOCKERS.

A great deal of study and care should be devoted to the construction of the building and the selection of the insulation, coils, and equipment. The building should be of fireproof material and of load-bearing construction, especially the locker room floor, because of the great weight when the lockers are filled with meat.

The insulation in this plant is Redwood Bark, six inches thick around the chill room, eight inches thick around the locker room, and twelve inches thick around the sharp freezer. The plant is powered with four Mills condensing units of the three-horse-

* Badger Refrigeration Co., Portage, Wisconsin.

AN AISLE OF THE LOCKER ROOM



A LOCKER IN USE.

power, four-cylinder type. On the front cover of this issue is a view of the machine room, showing the compressors and panel board. An interesting feature of this hook-up is the fact that the coils are all cross-connected so that the load of any coil may be transferred to any machine.

Great care should also be exercised in arranging the rooms for the convenience of the operator and consideration should be given to the loss of temperature from opening and closing of doors. The customary arrangement for a well constructed locker plant consists of a locker room located so as to permit later expansion and convenience for the customers. It has been found to be good practice to place locker room coils over aisles between locker rows for ease in defrosting. This room is usually kept at a temperature of 10 degrees above zero. The lockers are about 18 inches high, 20 inches wide and 30 inches deep and are constructed of sheet metal or metal mesh and angle iron frame work and will hold about 325 pounds of beef. Each locker has a locking device and each patron has his own key. These lockers are placed in tiers from four to seven high and in rows the length of the locker room.

THE PROCESSING ROOM.

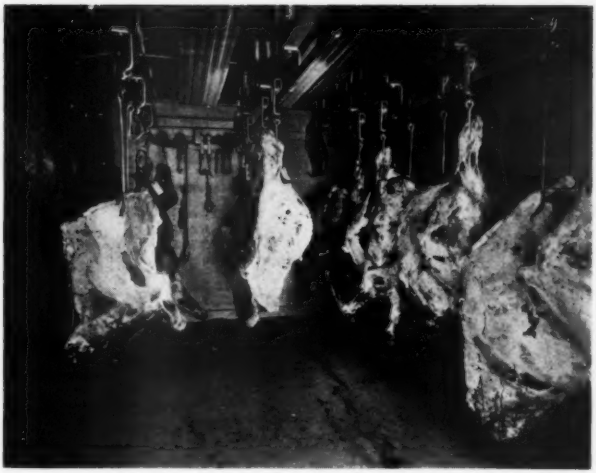
The sharp freezer room is usually maintained at a temperature of from five to

ten degrees below zero. The cooling coil is in the form of iron pipe coil shelves or plate shelves. These are placed on both sides of the room and the produce is placed directly on them, thus obtaining a rapid heat transfer and a comparatively quick freezing process. This room relieves the locker room from this great latent heat of freezing load and helps keep it free from odors caused from some products.

The chill room is used primarily for the aging of beef and mutton and is kept from thirty-four to thirty-six degrees. It also serves as a holding room and to provide a place to remove the animal heat from fresh killed meats.

There is another room operated in conjunction with these plants called the processing room where the meat is cut into steaks, chops, roasts, etc. These portions are then wrapped in parchment paper and placed in the sharp freezer room. The operator or butcher will also grind hamburger, make sausage and render lard at a nominal charge.

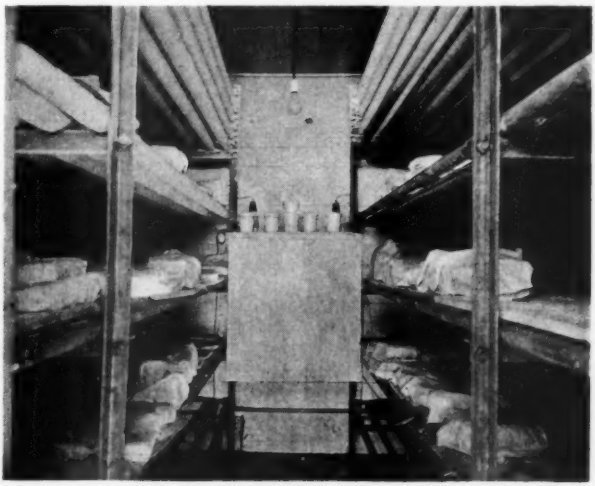
The majority of these plants have been equipped with the ammonia type of refrigeration in both the flooded and dry expansion systems, but the trend toward the Freon and Methyl Chloride type of units has been spreading fast in the past few months. The reason for this seems to be the fact that it is easier to control the multiple temperatures with multiple units and still stay in the same price range.



THE CHILL ROOM.

The total capitalization costs of a completed locker plant exclusive of the building and real estate runs from $15.00 to $25.00 per locker.

A great deal of study of these plants should be made by the service engineers. The owners of these plants will look for men that will be able to give good service because one can readily see that a 500 locker plant averaging 200 pounds per locker would be



THE SHARP FREEZER.

100,000 pounds, at 15 cents per pound represents $15,000.00 worth of perishable foods. These perishables cannot stand a raise in temperature of over fifteen degrees without impairing the texture and flavor of the products.

A New Use for Refrigeration

By WILLIS STAFFORD, Aurora, Ill.

"BETTER food at lower prices"—that is the theme song of the locker plant industry.

The depression taught us that we can get along without many things, but it is rather difficult to exist without food. With the cost of food at the price level it has been in the last few years, the average family must do everything possible to secure the best food at the lowest prices. These locker plants that are springing up all over the Middle West are doing a lot to accomplish this saving.

The cold storage locker plant differs from the regular cold storage plant that we in the refrigeration industry know. It must be so located that it is easily accessible to the public from the street. It must be a modern building and as clean as the housewife's kitchen.

It has been the practice of farmers to can their meat, because they did not like to sell their cattle and hogs to the packers for 10 cents a pound, and then buy it back from the butcher at 40 cents a pound. Likewise, the people living in town cannot always afford to pay the enormous prices that are charged for choice cuts of meat.

Let us see how this slogan of "better food at lower prices" is accomplished. A family buys a hog from a farmer (usually one that would be considered a choice piece of meat) at the prevailing market price. The farmer then butchers this hog and takes it into town to the locker plant. Upon its arrival at the plant, the carcass is put into the chill room for a period of about 48 hours. The temperature of this room is 38 to 40 degrees. After the meat has been thoroughly chilled, it is taken to the cutting room. Here the locker plant butcher cuts it up into pork chops, hams and bacons. The meat is then wrapped in a parchment paper and put into a sharp-freezing room, which is usually about 10 degrees below zero. After about fifteen hours in this room, it is frozen hard and is placed in the customer's locker to be stored until he desires to use it, piece by piece.

The most important step in this whole process is the sharp-freezing. The meat must be frozen very quickly to prevent the moisture in it from crystallizing and tearing the cells. This will happen if the meat is frozen slowly at a temperature above zero degrees. Also, the meat must be inspected before it is frozen to be sure it is satisfactory. Experience has shown that the freezing and storage of good meat increases the flavor, but the process will not improve a bad piece.

From an investment standpoint, the locker business has (in the majority of installations) become an economic success. The average cost of constructing a plant has been placed at $30.00 per locker, which includes the building, property and equipment. The operating costs of the plants average around $3.00 per locker per year, depending upon the local cost of electricity and water. Many of the plants have their own well for condensing water. This leaves $27.00 per locker for the payment of interest, principal and depreciation charge-offs. Of course, some deviation from this somewhat rosy picture is realized when all of the lockers are not rented. However, it has been the experience of most of the plant owners to add additional lockers to their plants to meet the demand of customers. The above operating cost does not include the salary of a butcher to cut up the meat and prepare it for the freezer. This cost is usually met by the locker renter paying the butcher by the pound for the cutting and wrapping. The average fee seems to be one cent per pound. In a plant of any size at all, the butcher does very well.

By simple arithmetic, it can be shown that the customer saves from eight to ten cents per pound. The Department of Agriculture has found that the average family of four will eat about one thousand pounds of meat per year. If the family secures all of

its meat in the locker plant manner (which is usually the case in most of the locker storages) there will be quite a saving on their meat bill. From this story, it would seem that anyone who is accessible to, and has the price of a quarter of beef or a hog, is a prospect for the use of a locker plant.

There are many scientific angles to this new business that must still be worked out. Many of the state universities are conducting tests on not only meats, but many other types of food to find out the effects of sharp-freezing and long cold storage. Several pamphlets have been published by them, giving recipes for preparing various fruits and vegetables to store in cold storage lockers.

As for refrigeration, several different types of plants have been used. Ammonia, methyl chloride and Freon systems, using one or several machines, have been used with success. The method of refrigeration is not so important. The temperatures must be held constant, and a dependable installation is the most essential.

It is a growing new industry which, like the refrigeration business, grew up during the depression. It demonstrates the fact again that our industry goes a long way to affect living costs and comforts.

Ninth Article

Air Conditioning

Factors Which Affect the Cooling Capacity of the Model 50F Air Conditioner.

By W. C. FARMINGDALE

IN last month's article, we learned just what the Carrier model 50F air conditioner is and how it operates. In this month's article we will study in detail how the unit is constructed, and the various factors which affect the cooling capacity of the unit.

Many model 50F units have given fine service for two or three years and their owners are now interested in having them overhauled and put in first class condition for the next cooling season. Since the refrigeration service mechanics are the logical men to do this overhauling, it seems advisable at this time to pass on some service and repair information through the pages of this, the refrigeration man's magazine. Before we can do this, however, we must understand those factors which affect the cooling capacity of the unit.

While the model 50F is basically a ¾ h. p. air-cooled refrigeration machine, it differs in many ways from a conventional refrigerating machine.

The Cooling Coil and Expansion Valve

First, since the cooling coil has to cool air only and does not have to make ice, the cooling coil should never frost. This means that the operating back pressure on the model 50F will always be above 30 pounds (Freon refrigerant). Ordinarily the back pressure will vary from 30 pounds to 45 pounds depending on the air temperature passing through the unit.

Next, because the unit is designed to operate with the full coil area operative at all times, a non-adjustable expansion valve is used on the machine. Hence, the serviceman or shop man does not have to set the expansion valve on this job to get the proper operating back pressure. All he must do is be certain that the strainer of the expansion valve is clean and that the feeler bulb is clamped to the drier tube on the cooling coil. It is extremely important that the serviceman realize that any adjustment he may make to the expansion valve (non-adjustable valves can be adjusted) to decrease the operating back pressure on the machine will reduce rather than increase the cooling capacity of the machine! When the machine is operating properly, the back pressure of the machine will be determined solely by the wet and dry bulb temperatures of the air passing through the cooling coil and by the wet and dry bulb temperature of the air through the condenser. Thus the back pressure may change from hour to hour throughout any day. Since the manu-

facturer recommends that a non-adjustable expansion valve be used on his product, and since an adjustable expansion valve cannot be used to increase the capacity of the machine, servicemen should use only non-adjustable valves on the model 50F. When replacing expansion valves, servicemen should be certain that they clamp the feeler bulb in the same location on the cooling coil as the feeler bulb on the old valve.

The Machine Compartment

Unlike ordinary refrigerating equipment, the machine compartment of the model 50F is divided into two separate chambers; one, the intake air chamber, and the other the exhaust air chamber. It is of extreme importance that these two chambers be kept entirely isolated in order to obtain rated capacity from the machine.

To fully understand why it is necessary to maintain this isolation, let us go back to last month's article and review how heat is removed from the machine compartment. In Fig. 1 the motor and compressor are located in the fresh air chamber, whereas the condenser and motor fan are located in the exhaust air chamber. Fresh comparatively cool air is drawn from out-of-doors into the fresh air chamber by the motor fan which is located in the exhaust air chamber. Now, there is always a slight vacuum in the fresh air chamber because the motor fan is pulling air out of this chamber into the exhaust air chamber. Since, air is being drawn continuously from the fresh air chamber and is being forced into the exhaust air chamber, there will always be a slight pressure in the exhaust air chamber.

If the two chambers are not totally separated from one another (except for the opening at the motor fan) air under pressure from the exhaust air chamber will leak back to fill the vacuum in the fresh air chamber and as a result little or no fresh air will enter the machine compartment from out-of-doors. That is, the air will short circuit from the exhaust chamber to the intake chamber.

This condition will materially reduce the capacity of the conditioner for two reasons:

First, since heated moisture-laden air from the exhaust chamber is going into the intake chamber, the same heated air is being passed over the condenser again and again. As a result, heat from the condenser is not being removed from the machine compartment and therefore the compressor can-

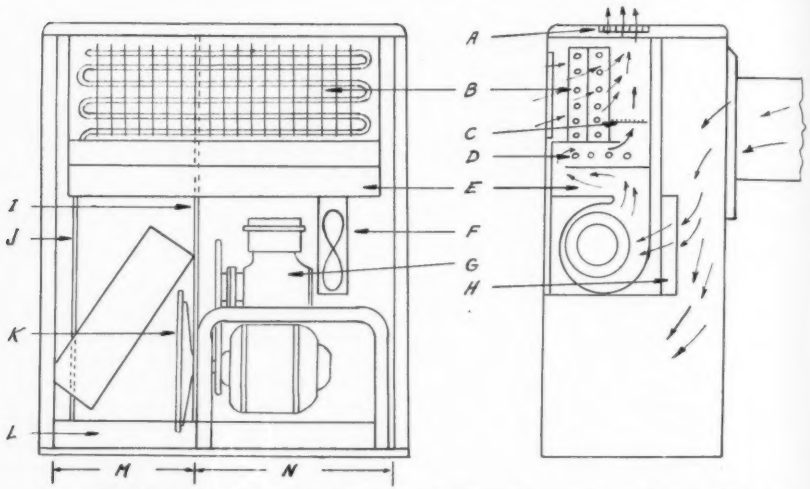


FIG. 1. FRONT AND SIDE DIAGRAM OF THE CARRIER MODEL 50F ROOM COOLER.

A—Discharge Grill
B—Cooling Coil
C—Air Nozzles
D—Fresh Air Cooling Coil
E—Silencing Chamber
F—High Velocity Fresh Air Fan
G—Compressor Body
H—Filter
I—Dividing Strip Between Fresh Air and Exhaust Chambers
J—Condensate Tube
K—Condenser Fan
L—Drain Pan
M—Exhaust Air Chamber
N—Intake or Fresh Air Chamber

not remove more heat from the cooling coil because the condenser cannot throw off its heat to the surrounding heated air.

Second, the fresh air supply to the room is taken from the intake air chamber (see Fig. 1). If heated, moisture-laden air occupies the fresh air chamber, this heated air is being passed through the discharge nozzles behind the cooling coil into the room. This imposes a heavier load on the cooling coil.

Thus you can see the necessity to maintain an air-tight division between the two chambers. In case the asbestos dividing strips between chambers (see Fig. 2) should get broken, you can see why it is extremely important that they be replaced with properly fitted ones.

Then, too, it is extremely important that the dividing strip in the duct (which connects the unit to the window) is in position. This strip allows fresh air to flow into the unit through one side of the duct and heated moisture-laden air to flow out of the unit into the out-of-doors through the other side of the duct. In case the dividing strip is misplaced or if it does not extend the full length of the duct, air will short circuit inside the duct and then heated moisture laden air will enter the intake chamber rather than fresh outdoor air.

When the model 50F must be installed in casement windows (windows which are hinged so that they swing into or out of a room) the window must be locked shut and glass removed from several sections of the window to allow special window ducts to be installed in the window. On installations of this type, care must be taken that the size of all the openings in the window is very nearly as great as the width and height of the duct. If the openings in the window are undersized, there will be considerable restriction to the flow of air through the duct and insufficient air will be supplied to the unit for cooling purposes. As a result, the cooling capacity of the machine will be seriously reduced. Also, on casement type windows, care must be taken that the divider strip in the duct be carried right to the window connection to prevent short-circuiting of air from discharge duct to intake duct.

Another important point in repairing or servicing the model 50F is to see that the motor fan is as close to the dividing wall between the two chambers, as possible. If this is not done, air from the discharge side of the fan will leak back around the edges

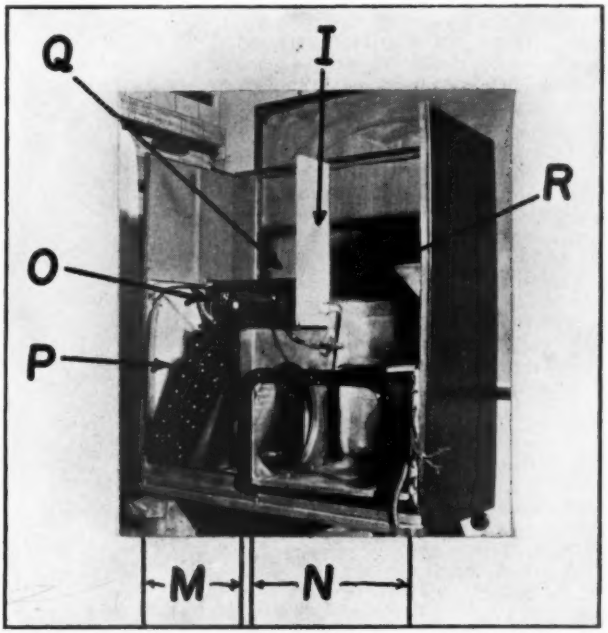


FIG. 2. FRONT VIEW OF ROOM COOLER PARTLY ASSEMBLED.

I—Divider strip between intake and exhaust chambers
M—Discharge chamber
O—Receiver
P—Condenser
Q—Opening in rear for exhaust connection
R—Intake opening in rear of cabinet

of the fan into the suction side of the fan and as a result, the amount of air passing through the two compartments will be materially reduced. Of course this loss of air volume will reduce the cooling capacity of the system because less than 450 cubic feet of outside air will pass through the machine compartments each minute.

Then, too, unlike other systems, the serviceman must realize that when the ventilating fan is not working properly, the cooling capacity of the system practically will be reduced to zero. This happens because room air will not flow into the conditioner unless the ventilation air at high velocity is passing through the nozzles in back of the cooling coil (see Fig. 1).

If something is wrong with the fan motor that causes it to slow up, you can see that insufficient air will flow through the nozzles to cause a slight vacuum behind the cooling coil and that therefore little or no cooling of room air will be accomplished.

Also, the serviceman should realize that under no conditions should the model 50F be operated without a filter, because any dirt that is in the fresh air duct will be drawn into the fresh air fan and sent through the nozzles. Since the nozzles have very small discharge holes, very little dirt is required to clog up these holes. Of course the cooling capacity of the unit will be greatly reduced if a number of nozzles get stopped up with dirt.

The Compressor Body

The compressor body used on the model 50F is quite different from that used on conventional refrigerating machines.

The compressor turns over at *980 r.p.m.* which is about 300 r.p.m. higher than conventional designs.

With head pressures above 100 pounds per square inch, the crankcase pressure cannot be reduced below 5 pounds per sq. in. This means that with the suction line shut-off-valve run all the way in, the compressor body will not go into a vacuum unless the head pressure is reduced to below 90 pounds per sq. in.

Figure 3 shows the various parts used in the model 50F compressor body. The cylinder block is cast in one piece and has two cylinders. The pistons are moved up and down in the cylinders by means of two babbitted bearing connecting rods and a counter-balanced crankshaft. When the pistons are at top center, they project about $\frac{1}{16}$ inch above the cylinder block! Hence, there is a spacer block about $\frac{3}{16}$ inch thick which is placed on top of the cylinder block between the cylinder block and the discharge valve plate. Thus on the model 50F, three head gaskets are required instead of the two gaskets required on conventional bodies. One gasket goes between the cylinder block and the spacer, a second goes between the spacer and the discharge valve plate and the third gasket goes between the discharge valve plate and the compressor head.

Because of the spacer block between the cylinder and the discharge valve plate, the compressor cannot reduce the back pressure below 5 pounds when the head pressure is above 100 pounds. This happens because

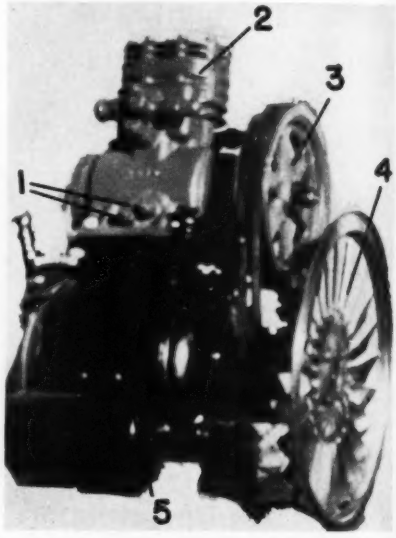


FIG. 3. COMPRESSOR AND MOTOR ASSEMBLY.
1—Oil test cock
2—Compressor body
3—Flywheel
4—Condenser fan
5—¾-h.p. capacitor motor

at back pressures under 5 pounds, sufficient gas is not drawn into the low side of the compressor to enable the compressor to raise the pressure inside the cylinder to 100 pounds when the piston is on the up-stroke. As a result, the compressor can't pump when the head pressure is above 100 pounds and the back pressure is down to 5 pounds. This effect is known as low volumetric efficiency. For a complete discussion on volumetric efficiencies of compressors, the writer refers you to the excellent article en-

titled "Determining Volumetric Efficiencies of Compressors" in the May, 1937, issue of THE REFRIGERATION SERVICE ENGINEER.

The low volumetric efficiency of the model 50F is a safety feature. Because of the relatively large amount of clearance between the bottom of the discharge valve plate and the top of the piston, a slug of oil or of liquid will not create a hydraulic pressure between the piston and discharge valve plate and hence there is little danger of blowing head gaskets or twisting compressor connecting rods when oil slugging occurs. Any hydraulic pressure that might be created in this compressor would be much more harmful than in conventional compressors because of the very high speed.

Very careful design has reduced oil slugging to a minimum in the model 50F. First truncated pistons are used so that suction gas flows directly from the suction valve into the cylinder through the truncated side of the piston rather than into the crankcase and then up through the piston as in many conventional jobs. Thus suction gas is kept almost entirely out of the crankcase. A specially designed oil return valve located in the crankcase below the suction valve boss, allows oil from the suction line to return to the crankcase without permitting very much gas to enter the crankcase.

Oil slugging is further prevented by the use of spoons on the connecting rod bearings which pick up the oil and fling it around the crankcase. With this spoon arrangement, oil is forced into the crankshaft bearings and a very low oil level is maintained in the crankcase. The connecting rods do not bathe in this oil; only the spoons dip into it. Hence, it is of extreme importance that the compressor runs in the right direction. If the compressor runs backward, the spoons will not force oil into the crankshaft bearings and the compressor will stick up. The correct direction is indicated by an arrow on the end plate.

The Grunow Thermene Gas Refrigerator

THIS system of refrigeration is the result of careful, planned research into the use of "activated" carbon and the harmless, non-poisonous, non-explosive refrigerant known as Carrene. Carrene has been used in Grunow electrically-powered refrigerators for four years, in conjunction with a rotary suction pump which created approximately 27 inches of vacuum . . . this causing the Carrene to boil in the evaporator, and so absorb heat from the food compartment.

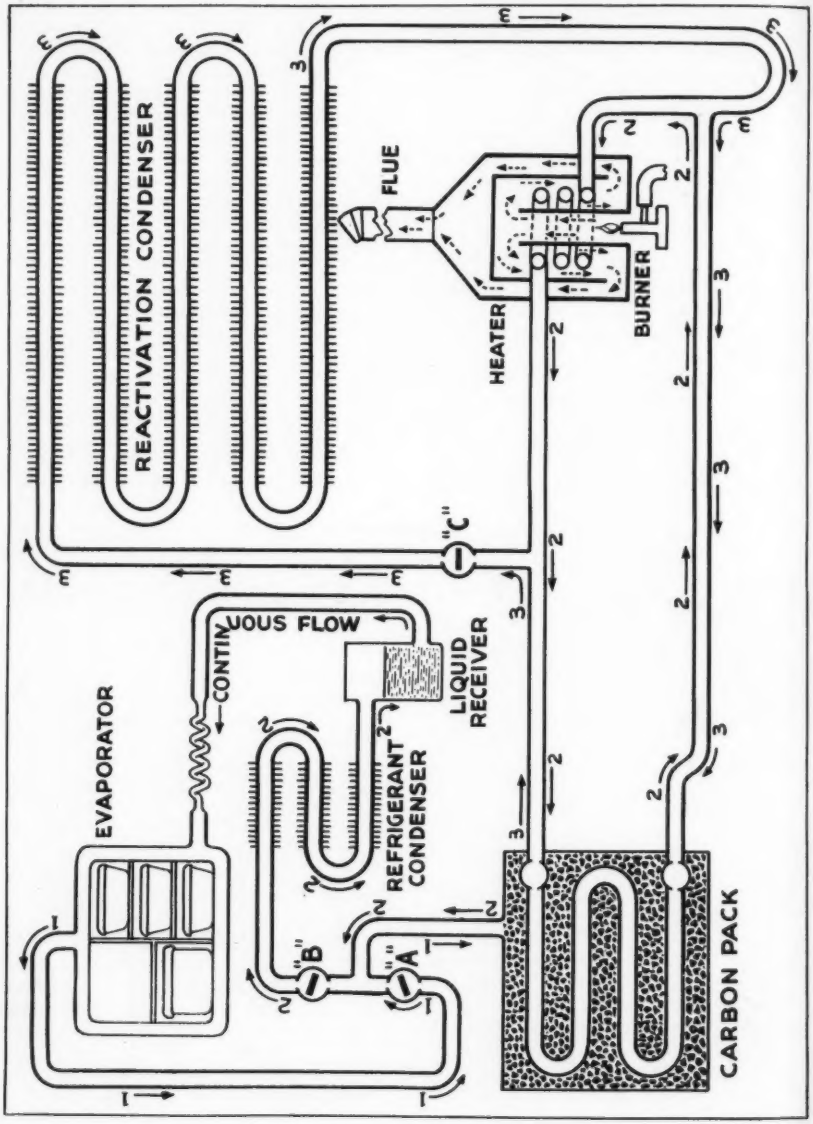
In Thermene Refrigerators, a container filled with a few pounds of pure, dry charcoal (activated carbon) is connected to the evaporator, producing, by its adsorptive power, 27 to 29 inches of vacuum. Briefly, there is a short but very powerful refrigerating period, a quick even heating of the carbon pack, and a fast cooling of the carbon. This trio of operations completes a cycle, and the carbon is again ready to pull Carrene.

The cycle of operation is as follows: in the schematic diagram Fig. 1 arrows identified as "No. 1" relate to the 1st stage, "No. 2" to the 2nd stage, and "No. 3" to the 3rd stage.

When a Thermene Refrigerator is first put into operation, the action of the activated carbon is identical with that of a suction pump; the "refrigerant" Carrene in the evaporator promptly boils and absorbs heat from the food compartment, the Carrene vapor passing down through check valve "A" to the carbon pack where it is held in the pores of the charcoal. Its course is indicated by the "No. 1" arrows. Since check valve "B" operates in the opposite direction, it is tightly closed during this activity.

The Heating Stage

It is now necessary to remove the "refrigerant" Carrene from the carbon, and this is done by means of a miniature "steam heating" plant which consists of finned pipes embedded in the carbon and a small low-pressure Carrene boiler called the "heater." A thermostat now becomes operative at a predetermined point, and the gas burner is turned "on." This heats and vaporizes a second supply of Carrene which we will call the "reactivating" Carrene, located in a small coil of pipe in the heater, and the resultant "Carrene steam" is carried to, and through, the finned pipes within the carbon pack, liquefies, and returns to the heater (as shown by some of the "No. 2" arrows).



During this heating stage, valve "C" is closed.

The "reactivating Carrene" is permitted to bring the temperature of the carbon pack up to about 225 degrees, which operation drives the "refrigerant" Carrene from the pores of the charcoal, up through check valve "B" to the Refrigerant Condenser, where it returns to its original liquid form (see "No. 2" arrows). Collected in the liquid receiver,

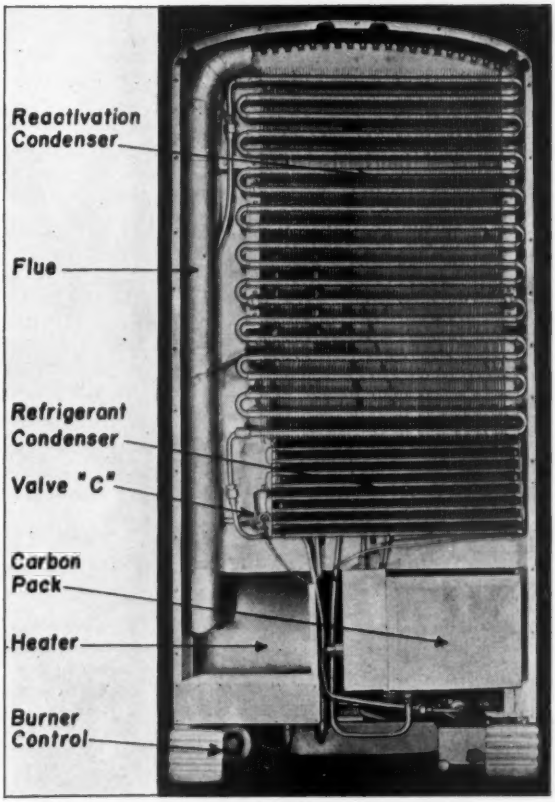


FIG. 1 (OPPOSITE PAGE). A diagrammatic illustration showing the operation of the Thermene Gas Refrigerator System.

FIG. 2 (RIGHT). A rear view of the refrigerator showing position of the various parts.

this "refrigerant" Carrene is continuously "metered" back into the evaporator.

An important part of Thermene operation is the fact that, valve "C" being closed, the heating of the "reactivating" Carrene in the coil of the heater traps a considerable quantity of this Carrene up in the "Reactivation Condenser" where it remains during the heating of the carbon pack.

The Cooling Stage

The "steam heating" of the carbon pack having driven the "refrigerant" Carrene from the charcoal, it is now desirable to cool the pack quickly. Automatic controls turn off the gas flame, open the valve "C," and cool Carrene from the Reactivation Condenser drops down to the carbon pack (as indicated by the "No. 3" arrows). Heat is absorbed from the pack as its heat vaporizes the cool "reactivating" Carrene and this vapor now passes up through valve "C," returning to the Reactivation Condenser where it is liquefied. The Carrene of the heating-cooling system is then back to its original state, valve "C" is closed, the carbon is cool and reactivated, the "refrigerant" Carrene is in the evaporator and liquid receiver, and the system is ready for another cycle of operation.

S S S

Jules P. Vergez,
Louisiana.

Without limit, I wish to congratulate and thank you for the interesting information you in the past year have furnished me.

Lester K. Kelly
Indiana

I get a lot of good from THE REFRIGERATION SERVICE ENGINEER, and I enjoy reading it. I find it very interesting.

Refrigerant Driers

Due to the number of inquiries recently received on this subject, it is deemed advisable to reprint the following excerpts from the original article of the same name, which appeared in Vol. 1, No. 3 of Ansul News.—Editor.

FOR several years, the question of what "drier" or dehydrating agent to use with various refrigerants has been asked repeatedly, and never authoritatively answered. Ansul's research department undertook the task of finding the answer, little realizing what a complicated job lay before them, requiring months of time, much patient plugging, and a considerable amount of diversified equipment and materials.

The refrigerants were limited to sulphur dioxide and methyl chloride, as results for the latter apply to similar refrigerants, such as the Freon group. Therefore the field is fairly well covered. Seven drying agents were tested under varying conditions as shown from the data submitted.

It is very important to note that this work was undertaken without any idea of proving or disproving the merits of any particular drier. It is an absolutely unbiased piece of research, performed with the greatest possible skill by expert technicians. "Let the chips fall where they may" might well be considered the attitude of real research, and this "drier" work is typical research.

A survey was made of the various drying materials and samples were secured for study of the better ones, i.e., activated alumina, silica gel, Drierite, calcium chloride, and calcium and barium oxides. Zinc was also secured for investigation as a neutralizer of acidity. Because of their known unsuitability in a refrigerator, or poor drying power, the following materials were given no further consideration: Phosphorus pentoxide, sulphuric acid, calcium bromide, zinc chloride, zinc bromide, and copper sulphate. The perchlorates were not studied because of the explosion hazard when used with methyl chloride.

Experimental Apparatus

In order to determine how closely the driers would approach their ideal limits under practical conditions, a number of units were designed to duplicate as closely as possible the action of a drier in a refrigerator. Figures 1 and 8 are photographs, respectively, of liquid phase and vapor phase drier units. Figure 2 is a line drawing to show the construction of the liquid phase drier assembly. A sample of wet refrigerant containing eight per cent refrigeration oil was contained in the cylinder at the top of the apparatus. After purging air from the system, the refrigerant was forced as a liquid through the drier by applying heat to the upper cylinder by means of the heating pad, which consisted of corrugated pipe covering threaded with resistance wires. The amount of heat was controlled by using a lamp bank as external resistance.

When the liquid had all passed into the lower cylinder, a sample for moisture analysis could be secured at the valve at the bottom of the lower cylinder. After sampling, the board was inverted and the liquid again passed through the drier. The inversion and sampling (after an odd number of passages) was repeated as often as desired.

In the case of the vapor phase drying units, a somewhat different plan was followed as illustrated by Figure 4. Here again the wet refrigerant containing the oil was placed in the cylinder at the top of the apparatus. On cracking the cylinder valve the refrigerant flowed downward because of the lower condensing pressure maintained by the circulating water around the bottom cylinder. By examining the bullseye, it was possible to adjust the flow at such a rate that all the refrigerant was vaporized by the heater coil before entering the drier. The heater coil consisted of 10 turns of ¼ inch copper tubing and was covered with a thin layer of sheet asbestos molded to fit. Heat was supplied by standard 600 watt heater elements, three being connected in series. The lower cylinder was removed to take the samples for moisture tests. If additional passage of the refrigerant through the drier was desired, the cylinder was put at the top of the unit and an evacuated one used at the bottom.

The driers were contained in commercial units of about 14 cubic inches capacity.

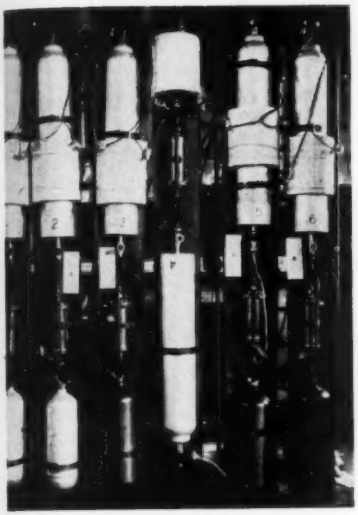


Fig. 1.

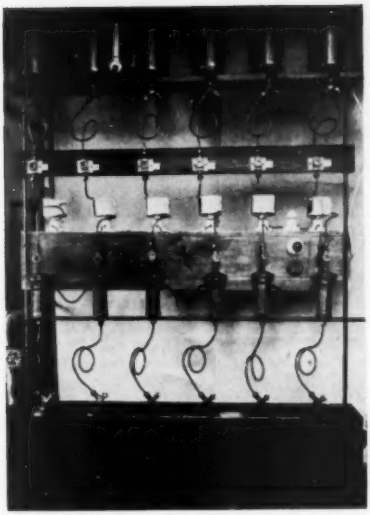


Fig. 3.

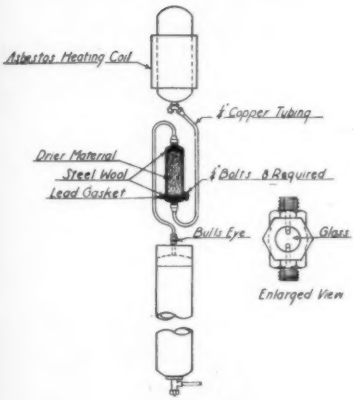


Fig. 2.

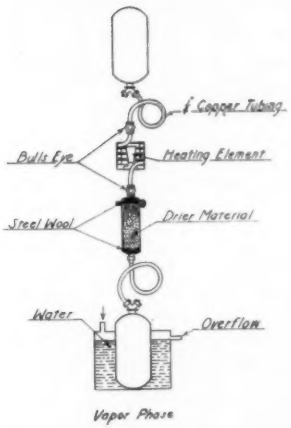


Fig. 4.

Steel wool was used in the ends of the units instead of the usual screens and felt since dusting of the drier material was of little consequence and the felt pads proved unsatisfactory at the high temperatures used for activation of some of the materials. Since a drier does take up moisture, it must not be exposed to the air longer than necessary while it is being packaged, while it is standing around the shop or while it is being charged into a drier unit. *Experimental tests showed that some of the common drier materials as purchased were so poor that they actually added moisture to the system.* In order to be sure of determining the maximum efficiency, most of the tests were made on materials which were secured in factory sealed containers or were reactivated in the drier unit itself shortly before use.

It is believed that reactivation of used driers is impractical for all except those using large quantities.

Experimental Results

Two sets of tests were made, the first starting with a relatively low moisture content, (.02 per cent), in order to determine the ultimate drying power of the various materials on passage of the refrigerant through the drier until no further drying was evident on analysing for moisture. The second set of tests using a very wet sample (.25 per cent water) was made to determine how rapidly and completely the drying of a really wet machine could be accomplished and also to show to some extent the relative moisture removing capacities of the driers. The data secured are summarized in Table I.

Conclusions and Recommendations

The following points should be considered in selecting a drier for use in a refrigerant system:

1. Does the material dry the refrigerant below the corrosion limits when placed in the liquid line? In the suction (vapor) line?
2. Does the material dry the refrigerant below the limits for ice formation with methyl chloride?
3. Does the material accomplish the drying in one passage of the refrigerant, or is it slow, i.e., requires several passages?
4. Does the material deteriorate in physical character in handling or when it removes water from the refrigerant?
5. Does the oil affect the drier adversely?

It should be understood that a drier must remain on a refrigerator a long time, since concentration of moisture in the cold parts and dilution of the wet refrigerant by the dried refrigerant in the receiver or evaporator will result in a long time being required before sufficient moisture will reach the drier and be removed.

On the basis of these experimental tests certain general and specific conclusions may be reached.

Tests with Relatively Dry Refrigerants

The driers must be a good grade, must be properly handled and not exposed to the air

TABLE I—DRYING POWER OF VARIOUS MATERIALS

Drier	Refrigerant	Liquid or Vapor	Maximum % Residual Moisture* (Initial water concentration) .25%	.02%
ACTIVATED ALUMINA	Sulphur Dioxide	L	.15	.005
		V	.01	
	Methyl Chloride	L	.02	.006
		V	.01	
SILICA GEL	Sulphur Dioxide	L	.15	.006
		V	.01	
	Methyl Chloride	L	.01	.004
		V	.01	
DRIERITE (Calcium Sulphate)	Sulphur Dioxide	L	.15	.009
		V	.08	
	Methyl Chloride	L	.05	.003
		V	.04	
CALCIUM CHLORIDE $CaCl_2$	Sulphur Dioxide	L	.09	.013
		V	.03	
	Methyl Chloride	L	.10	.005
		V	.04	
CALCIUM OXIDE CaO	Sulphur Dioxide	L	.20	——
		V	.15	——
	Methyl Chloride	L	.15	——
		V	.08	——
BARIUM OXIDE BaO	Sulphur Dioxide	L	.20	.017
		V	.15	
	Methyl Chloride	L	.05	.006
		V	.05	
ZINC	Sulphur Dioxide	L	.25	——
		V	.25	——

* Excluding samples which were of definitely poor grade.

longer than is absolutely necessary.

Any of the driers listed below will give satisfactory results with methyl chloride if the machine is quite dry (.02 per cent moisture) when the drier is inserted in either the liquid or vapor line.

Any of the driers except calcium and barium oxides will give satisfactory resuts with SO_2 under the above conditions.

Tests with Very Wet Refrigerants

When the machine contains a larger amount of moisture, not all of the driers will prove equally satisfactory. In order to take care of such a wet machine as well as one having a small amount of moisture, the best drier should be used in all routine work *for a service man cannot ordinarily determine whether a large or small amount of water is present.*

When the .25 per cent moisture was used, none of the materials dried the refrigerants to as low a limit as was secured in the .02 per cent moisture tests, indicating that under the practical conditions, the driers do not even approach the 6 per cent, 10 per cent, 20 per cent or more capacities claimed for the various materials. These claims, incidentally, are based on entirely different types of tests and considerations and should not be expected to hold for the practical applications as encountered in the field of refrigeration.

In the following specific cases, a material is said to dry satisfactorily if the moisture content of a refrigerant containing .25 per cent is reduced in one passage below the corrosion limit for sulphur dioxide or methyl chloride and below the point where ice crystals will form in methyl chloride. It must be noted that these tests are based on experiments with very wet refrigerants and are more severe than will ordinarily be encountered. A drier which here proves unsatisfactory may be suitable in instances where the moisture content is lower.

Activated Alumina will dry sulphur dioxide satisfactorily in the vapor phase only; it will dry methyl chloride satisfactorily for usual applications in either liquid or vapor phase although vapor phase drying is somewhat more effective and may prove more satisfactory if very low temperatures are required. Use of the drier in the liquid line with methyl chloride will in general lessen the possibility of ice crystal formation if moisture has entered the high side of the machine.

Activated alumina is not affected in physical character by oil or moisture. It tends to dust only to a slight extent in handling.

Silica Gel will dry sulphur dioxide satisfactorily in the vapor phase only. Methyl chloride will be dried satisfactorily either as a liquid or as a vapor. This drier is unaffected by oil or water and is almost dustless.

Drierite did not provide satisfactory drying of either sulphur dioxide or methyl chloride. In addition to not reducing the moisture content as low as desirable, Drierite is somewhat slow in its drying action.

In the presence of large amounts of water as at the inlet of the drier, the lumps of material show a slight tendency to disintegrate and become somewhat pasty. Drierite shows a moderate dusting tendency.

Calcium Chloride did not dry either sulphur dioxide or methyl chloride satisfactorily and what drying action there was appeared to be slow. In the presence of the large amount of water which collected at the inlet end of the drying material, the calcium chloride granules fused together to quite some extent and formed a cake.

Calcium and Barium oxides did not prove at all satisfactory. On absorbing water, and slowly at that, the oxide became powdery and in some cases gummy in the presence of the oil.

While a moderate amount of dusting is not harmful if an efficient filter is used, excessive dust may result in a plugged filter with consequent high pressure drop in the line.

Zinc was found to have absolutely no value in reducing moisture in sulphur dioxide. As data published in the chemical literature indicate, it was found that the zinc and sulphur dioxide react to form complex solid materials without reducing the moisture. Because of the possible explosion hazard (Ansul News, Vol. 1, No. 2) the use of zinc in methyl chloride was not studied. Pads of fine steel wool in the drier unit should prove as effective as zinc in reducing acidity in methyl chloride.

S S S

Wm. N. E. Harris
Massachusetts

As this is the first time in four years I have had occasion to write to you, may I pay tribute to your publication. It has never stood still, and gets better each month, returning larger "dividends" all the time.

The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment as well as oil burners to "The Question Box."

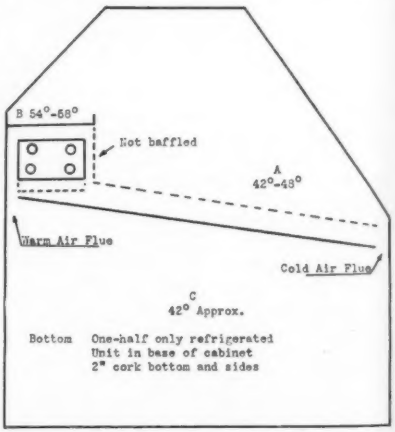
DISPLAY COUNTERS

QUESTION 244. I have experienced considerable difficulty this summer with a type of counter as shown on the enclosed diagram. There are two installations giving trouble at present, one as shown and another that has the same coil and counter layout, but with a remote unit and full storage space in bottom with double glass and 2-inch cork insulation. Taking the single glass case first, customer says temperature at A not cold enough, weiners become damp; cooked meats on back shelf do not keep; temperature in bottom not low enough. The job had been in about two months before I was sent out. I raised coil off the bottom as shown about 1 inch. Do you consider this case of good design? Would 4 rows of ⅝-inch tubing in top with air deflection down the back of case help platter temperature there? Could this coil be operated in series with present coil and how? Is fin space too narrow resulting in complaint of quick frosting and icing of coil, resulting in raising temperature? Would you recommend wider fin spacing? Spinner coil tubing? Can I expect temperatures from this case better than those shown at present? I found hole through which tubing passed from inside to outside unplugged and closed this up. Would you expand into top or bottom of present coil and why? Considerable milk business is done and coil in front of warm air flue became heavily iced during very hot and humid weather. Customer objects to defrosting himself. What do you consider the heat leakage to be? How long could steaks and chops be kept fresh on front platters? When trays are placed on back shelf over coil, the opening between each is not over ¾ inch for air to go down between the platters. The front platters of counter are well filled with bologna and liver sausage and sometimes overhang the trays. Since this is a low-priced counter, is this man expecting too much?

On the double glass remote unit counter the complaint is that meats on back platters become very wet and slimy and water gathers in platters. Also outside of lower storage space sweats. Bottom temperatures are 36 degrees with 2-inch cork, and sometimes lower with very high humidity. With unit in cold cellar, will difficulty be found with getting back pressure to start machine in the wintertime? What would you recommend?

ANSWER: I do not like to criticize anyone's design of equipment, but I do feel that it would be almost impossible to get satisfactory refrigeration results with the design of refrigerator as shown by your sketch.

It would seem to me that the air would circulate downward from the circulating coil through the cold air flue down through the lower part of the case and then up the



left warm air flue and over the coil and that a comparatively small amount of air would circulate down by the coil and up around the meat trays and back over the top of the coil. The slow air circulation will account for the fact that the meat becomes damp, and the fact that the temperature is not as low as it should be will account for comparatively rapid spoilage.

I should say that the only method of properly cooling this case would be to put in an overhead coil so as to get the circulation from the overhead coil down on top of the pans.

In addition, the whole case, I would say, is poorly built as far as insulation goes and it is doubtful if you can get really satisfactory results in this kind of case.

If the upper part of the case was kept at the desired temperatures, doubtlessly the glass would steam on the outside so that the meats would not be visible through the glass anyway. I believe it would be very difficult to do a satisfactory job with this case.

With respect to the double glass counter having a remote unit, the fact that the platters become very wet and slimy may be due to the fact that you are getting improper air circulation. In general, this may be due to the fact that the platters are cooled very well on the bottom, but that the air above the platters is both warm and moist and the moisture condensing out of the air gives the slimy condition and is responsible for the water gathering in the platters.

In this case, too, better results would be obtained by using an overhead coil. With the condensing unit in a cold basement it may be advisable to use a temperature control in the counter for wintertime use as otherwise there is a very great possibility that the refrigerant pressure may not be sufficient to start the machine provided the basement temperature is lower than the temperature desired in the counter.

OIL BURNERS

Question 245. In the October, 1934, issue of your paper, I saw an article under "Building Off-Peak Servicing" on page 23. It tells about a portable test equipment. I would like to buy one of these. Please give me more data on it and also advise where I can buy one. Also, some other test equipment used on oil burners.

Answer: The three instruments which I can think of at this time, being required in service work of this nature, would be: a high temperature thermometer, reading possibly up to 900 degrees; an orsat, with which you may make a flue gas analysis; and a draft gauge, with which to determine the draft in the flue.

Thermometers of this type may be purchased from the Taylor Instrument Cos., and I believe they will also handle orsats and draft gauges. However, the Hayes Corp. have what seems to be a very fine instrument, which combines the automatic orsat and draft gauge in one handy case. If you write them, I am sure you will be able to get full particulars on it. These companies will also supply you with instructions on the use of these instruments when purchased.

FLOATS AND STICKY COMPRESSORS

Question 246. (1) How can one distinguish between a leaky low side float valve and one that is slightly short of refrigerant? They both hiss.

(2) Can a high side float be used to control a "dry" expansion system?

(3) If a low side float valve is leaking, could a high side float be used to control the refrigerant properly if the evaporator is just enough short of refrigerant so as to hold the low side float needle away from its seat. The reason I ask this question is because I have run into several leaky low side floats where the header was welded on. In a case like this, wouldn't it be advisable to substitute the high side float?

(4) In a refrigerating system where the compressor turns too hard, could one lay the blame on a shortage of oil, a gummy substance on the piston and cylinder walls, or sulphuric acid formed? If so, how can you tell which one it is? In the case of sulphuric acid being formed, would it cause the compressor to turn hard or bind it completely?

Answer: Answering the questions in the order in which they appear:

(1) A leaky low side float valve and one that is short of refrigerant may be determined by the fact that on a leaky valve, the return line will frost, perhaps all the way to the compressor, depending on the extent of the leak, whereas a system that is short of refrigerant will not frost the return line, but a hissing noise may be heard.

(2) A high side float can be installed to control the dry expansion system, providing of course, the suction line is taken from the top of the evaporator, rather than at the bottom, as is sometimes found in dry expansion systems and an accumulator is installed on the outlet side of the coil.

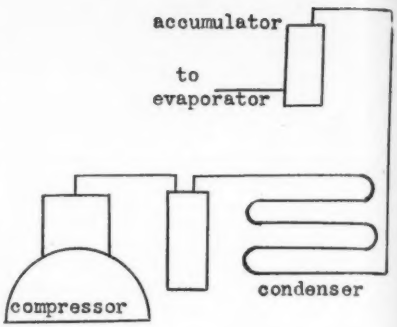
(3) I don't believe that a low side float valve could be replaced with a high side float, and also leave the low side float parts in place. The amount of refrigerant that would be necessary to leave this system short in order to keep the low side float from

shutting off the flow of gas would not be sufficient to properly operate it. Preferably, I would say that the suction outlet of the float should be used as a liquid inlet, and a new suction outlet be drilled at the top of the evaporator and tapped for a flare fitting. I would further say that in my experience, I have never seen a float head that was welded on. Many of these are soldered in place, but can be easily removed for repairs by the application of heat, and then resoldered into place.

(4) Binding of a compressor can be due to any one of the causes you have named. To distinguish between each is not possible without in some cases tearing down the compressor. However, if the compressor has an oil filler plug on the side, the shortage of oil might be determined by removing this plug, and inserting a wire, which will act as a gauge to determine the oil level. A binding compressor, due to gummy substances on the walls of the cylinder or to sulphuric acid forming, which will produce the same thing, may cause the compressor to entirely bind up so it cannot be moved at all.

KELVINATOR 1937 MODEL

Question 247. Recently I examined a new Kelvinator 1937 model refrigerator, and found a queer hookup; at least, it seems to work against the principles of refrigerator requirements. After the vapor leaves the discharge valve of compressor, instead of entering a condenser, it is led into a tank which must be a high side float, which would put the condenser on the low side of the system. That wouldn't work, because the gas wouldn't become liquefied, and if this tank is an oil receiver, how is the oil returned to the compressor? There are no visible lines leading to compressor. The diagram is the exact hookup of this model, and although the system operates satisfactorily, it seems like a "goofy" hookup to me. When machine is running, a loud gurgle can be heard.



Answer: The tank, which you speak of, installed between the compressor and the condenser, is an oil trap. This trap has no return direct to the compressor, but is designed to take care of the sudden slugs of oil which may be discharged from the compressor.

Oil will accumulate in this tank, and gradually be dissipated with the gas through the system, returning in the conventional manner. The gurgling noise you hear is, no doubt, the refrigerant bubbling through the accumulation of oil that was in it at the time.

The tank you have marked in your sketch as an accumulator is, in all probability, a high side float. These are installed preferably where space permits near the top of the box, or as near as possible to the evaporator, in order to eliminate loss of refrigeration through a long run of liquid line from the float to the evaporator.

INEFFICIENT COMPRESSOR

Question 248. I have a problem in refrigeration I need some help on. There is a compressor here that will only pull down to 15 inches vacuum. It takes about 2 minutes to do this. It is hooked-up to two Frigidaire coils low side float. It worked fine until this summer; then, it quit or did not cool the box in hot weather. A serviceman from a town next to here was called. He fooled all summer with it, and finally gave it up. I was called. I checked the suction after finding that it pulled down to only 15 inches vacuum. I told the party I could not do much until the compressor was checked for piston side play, etc. I claimed it would not pull down fast enough and low enough to be efficient. In cool weather, it works okay. I would like to know what you think about it. Valves are okay in the compressor. I believe there is too much lost along the side of the pistons. Please let me know if I am right.

Answer: Without question, if the compressor will not pull down to less than 15 inches vacuum, there is something wrong with the suction valve, the piston rings, or the piston and cylinder wall itself.

In checking your trouble, I would suggest that you check the suction valve first, since it is the most likely source of the trouble. Next, I would check the piston rings to

determine whether they are stuck in the grooves. It is quite possible, due to an accumulation of carbon, that they are held tightly in a groove, not permitting an expansion against the cylinder walls.

If neither of these is the fault, then it is probable that the pistons or the cylinder wall are sufficiently worn to permit the blowing past of gas. This last item, however, is not very probable, unless the compressor is a very old one, since wear at this point seldom occurs to such an extent.

NEW MECHANICAL DEVICES

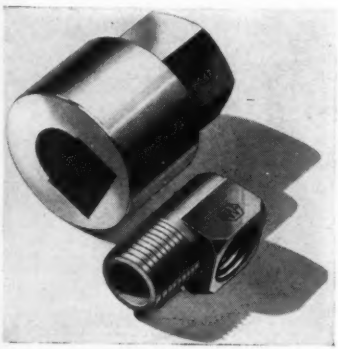
Service Tools and Special Equipment

Under this heading there will be published illustrated descriptions of new or improved service tools and equipment for the Service Engineer. Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

WEATHERHEAD ANNOUNCES NEW WRENCH SOCKET

NO slip—no squeeze—no crush, is an appropriate description of a new wrench socket just announced by the Weatherhead Company for removing elbow-shaped fittings.

This new wrench socket provides a tool long needed in the repair man's kit. Those working on oil burner service will welcome its addition to their equipment.



ELBOW FITTING WRENCH SOCKET

Many fuel and oil line elbows have been crushed with pliers or twisted into useless shapes with an ordinary wrench for lack of a better tool. With Weatherhead's new wrench socket all danger of distortion is eliminated. The wrench socket is designed so that it turns on the center line of the thread of the elbow without causing the elbow to wobble or the feed line to twist.

The socket cannot slip nor burr the elbow because it fits the elbow exactly. Made in three sizes ¼ inch, ⅜ inch and 5/16 inch, a set of three will fit all Weatherhead elbows used on practically all makes of cars on the road today.

The complete set of three sizes comes packed in a single container and sells to the trade for only $1.25.

S S S

ALCO VALVE INTRODUCES ENGINEERING SERVICE

THE Alco Valve Company has recently introduced a four-page Engineering Data Sheet to provide the refrigeration and air-conditioning industry with an easy means of obtaining engineering application recommendations. When these forms are properly filled in with all of the necessary information, they are to be sent to the Application Engineering Division of the Alco Valve Company. Control application recommendations are sent immediately after this information has been received.

The Engineering Data Form is designed to obtain all of the information necessary to recommend proper automatic control application. It may be used for existing installations or new installations in the process of design. This Data Sheet has several sections; one for compressor or condensing unit data, another for evaporator data and another for liquid and suction line information. Other pertinent questions are asked to determine such facts as the type of controls in use, and the manner in which they are applied. Ample space is provided in the Data Form for sketches or drawings. This form is very complete and calls for attention to all of the information necessary to

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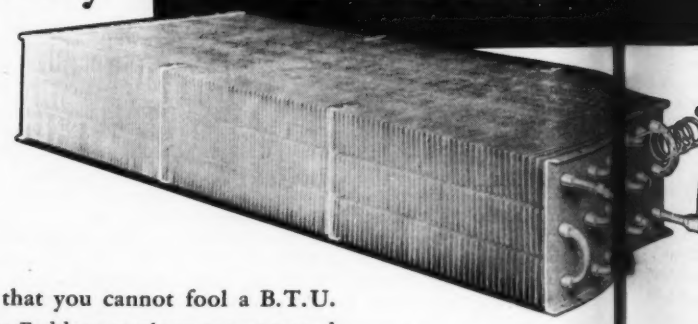

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Alter Company, The Harry
Automatic Heating and Cooling Supply Co.
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H. W. Blythe Co.
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Merkel Brothers Co.

CLEVELAND, OHIO
Alter Company, The Harry
Debes & Company

COLUMBUS, OHIO
Hughes-Peters Electric Corp.

DALLAS, TEXAS
Fedders Manufacturing Co.
Beckett Electric Co.

DAVENPORT, IOWA
Republic Electric Co.

DAYTON, OHIO
Allied Refrigeration Co.

DENVER, COLO.
Auto Equipment Company

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Gustave A. Larson Co.

MEMPHIS, TENN.
United Refrigeration Supply

MIAMI, FLA.
Berner-Pease, Inc.

MINNEAPOLIS, MINN.
Refrigeration & Industrial Supply Co.

MONTGOMERY, ALA.
Teague Hardware Company

MONTREAL, QUE.
Airco Refrigeration Parts

NEWARK, N. J.
Melchior, Armstrong, Dessau Co.
T. W. Binder & Company

NEW ORLEANS, LA.
Enochs Sales Co.
The Spangler Company, Inc.

NEW YORK CITY
Fedders Manufacturing Co.
Aetna Supply Co.
Airo Supply Co.
Alter Company, The Harry
Melchior, Armstrong, Dessau Co.
Paramount Electric Supply Co.
Servicemen Supply Co., Inc.

NORFOLK, VA.
Noland Company

OKLAHOMA CITY, OKLA.
Macklanburg, Brass & Copper Products, Inc.

PATERSON, N. J.
White & Shauger, Inc.

PEORIA, ILL.
R. E. Thompson Co.

PHILADELPHIA, PA.
Fedders Manufacturing Co.
M. & E. Refrigeration Accessories Co.
Melchior, Armstrong, Dessau Co.
Victor Sales Corporation

PHOENIX, ARIZ.
Pratt-Gilbert Hardware Co.

PITTSBURGH, PA.
William M. Orr, Co.

PORTLAND, ORE.
Bill Hieber, Refrigerative Supply Dist.
Stone Supply Co.
Refrig. & Power Specialties Co.

PROVIDENCE, R. I.
R. I. Supply & Engineering Co.

RICHMOND, VA.
Refrigeration Supply Co.

ROCHESTER, N. Y.
Melchior, Armstrong, Dessau Co.
Pfaudler's Refrigerator Parts, Inc.

ROCKFORD, ILL.
Gustav A. Larson Co.

SACRAMENTO, CALIF.
Hinshaw Supply Co.

SALT LAKE CITY
Refrigerating and Power Specialties Co.

SAN ANTONIO, TEXAS
Strauss-Frank Co.
Westbrook Carburetor & Electrical Co.

SAN DIEGO, CALIF.
Allied Refrigeration

SAN FRANCISCO, CAL.
California Refrigerator Co.
Pacific Metals Co., Ltd.
Refrigerating & Power Specialties Co.

SCRANTON, PA.
Central Service Supply Co.

SEATTLE, WASH.
Refrigerating & Power Specialties Co.
Refrigerative Supply, Inc.

SIOUX CITY, IOWA
Refrigeration Supply Company

SOUTH BEND, IND.
South Bend Supply Co.

SPOKANE, WASH.
Brown-Johnson Co.
E. S. Matthews, Inc.
Refrigeration Parts Supply Co.

ST. LOUIS, MO.
Alter Company, The Harry
Brass and Copper Sales Co.
R. E. Thompson Co.
The Spangler Company

ST. PAUL, MINN.
Thermal Service Co., Inc.

SPRINGFIELD, MASS.
C. P. Payson Co.

SYRACUSE, N. Y.
Syracuse Equipment Co.
Syracuse Supply Co.

TOLEDO, OHIO
Baumgardner Distributing Co.

TORONTO, CANADA
Davis Automatic Controls Co.

TROY, N. Y.
Aird-Don Company

WASHINGTON, D. C.
Melchior, Armstrong, Dessau Co.
Refrigeration Supply Co.

WEST PALM BEACH
Motor Parts & Equipment Co.

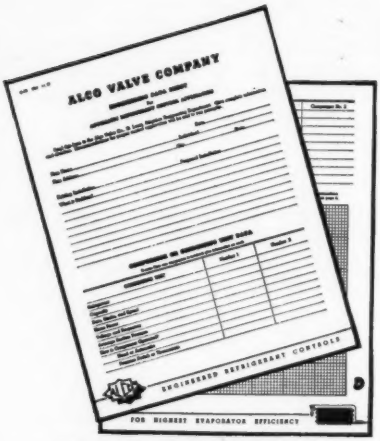
WILKES-BARRE, PA.
Radio Service Co.

WORCESTER, MASS.
Standard Supply, Inc.

VANCOUVER, B. C.
Fleck Bros., Ltd.,

WHITE PLAINS, N. Y.
County Seat Plumb'g Supply Co., Inc.

ARE YOU GETTING YOUR COPY OF THE FEDDERS NEWS?



DATA SHEETS SUPPLIED BY ALCO VALVE CO.

satisfactorily solve a control problem.

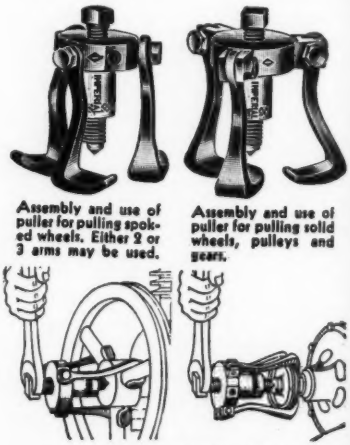
For years the Alco Valve Company, through its factory engineers and district representatives, has supplied engineering assistance in the application of automatic control equipment for refrigeration and air-conditioning. Test work done on standard evaporators supplies much of the information which the Alco engineers have contributed to the industry. The Alco Valve Company has devoted the past several years to testing standard low-side evaporators. Over two hundred recognized standard commercial and air-conditioning evaporators have been carefully tested both in the laboratory and in the field. Most of the low-side manufacturers have submitted evaporators to the Alco Valve Company for test. By knowing such characteristics of standard evaporators as pressure drops, trapping, and distribution peculiarities, Alco and its field engineers are able to assist in properly applying control equipment for best performance. The new Engineering Data Form makes it easy for contractors, engineers and installation men to obtain such application information.

UNIVERSAL PULLEY AND FLYWHEEL PULLER DEVELOPED BY IMPERIAL

A COMPACT, lightweight (two and one-half pounds) and easy-to-carry pulley and flywheel puller, for use with practically all refrigeration compressors and adapted for pulling either from the spokes or from the outside of the wheel, has been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.

Puller will pull spoked wheels of any size having a hub diameter of less than 3 inches, and it will pull solid wheels up to 7 inches in outside diameter. Arm-type design makes attachment to wheel remarkably simple.

Construction of puller is exceptionally strong and durable, the manufacturer states. The arms are made from heat-treated chrome vanadium steel forgings and the pressure screw is extra large so that the screw head can be hammered in removing hard-to-start pulleys. The body is machined from cold drawn steel. No castings are used.



Assembly and use of puller for pulling spoked wheels. Either 2 or 3 arms may be used.

Assembly and use of puller for pulling solid wheels, pulleys and gears.

PULLEY AND WHEEL PULLER

Puller is furnished with three arms. When used to pull from the spokes of spoked wheels, it is assembled with the arms attached directly to the body of the puller, as shown in the left hand illustration. When used to pull from the outside of solid wheels, it is assembled with arms suspended from clevises as shown at right.

On spoke pulls, the puller is used with three arms for wheels having an odd number of spokes, and with two arms for wheels having an even number of spokes. Arms are so designed that the puller can be used with wheels having tilted spokes and also with wheels which have a minimum amount of space between seal plate and hub.

An exclusive feature listed for this puller is a no-tilt adjustable sleeve. This sleeve

rests on the hub of the pulley and prevents tilting of the screw when pressure is applied on two-arm spoke-pulls.

Puller is four and one-half inches long, four and one-eighth inches in diameter. Depth reach is one and one-half inches. Offered in two models: No. 372-F, priced at $6.85, is for use with both solid and spoked wheels, pulleys and gears. No. 370-F, priced at $5.85, is supplied without clevises and is for use with spoked wheels and pulleys only.

THE DETROIT NO. 679 VALVE

THE No. 679 Detroit Thermostatic Expansion Valve is an all-purpose valve, recommended for general domestic and commercial use where the evaporator capacities do not exceed one-half ton Freon and sulphur dioxide, or one ton methyl chloride. It provides for superheat adjustment without the necessity of removing the valve from service.

The power element of the No. 679 valve is gas-charged, as are all Detroit Thermostatic Expansion Valves. Refrigerant is charged into the power element in the gaseous form at a predetermined pressure. This pressure determines the maximum point at which the valve can open. When the suction pressure is above this point, the valve

MODEL 679 VALVE

must remain closed regardless of temperature. When the pressure pulls down to the predetermined point, the valve begins to open and maintains a constant pressure until the feeler bulb becomes cooled. At this point, part of the gas charge condenses into a liquid and the valve then operates in the usual manner.

Regularly supplied with $\frac{1}{16}$-inch orifice. Also available with $\frac{1}{32}$-inch orifice for those jobs where the load does not exceed the rating for $\frac{1}{32}$-inch. Inlet connection furnished with screen assembly and flare nut for $\frac{1}{4}$-inch or $\frac{3}{8}$-inch O. D. tubing. Outlet connection $\frac{1}{4}$-inch female I.P.T. Can be furnished on special order with flare tube outlet or sweat fitting outlet connection. $\frac{1}{4}$-inch flare nut inlet and $\frac{1}{4}$-inch I.P.T. outlet is standard.

The feeler bulb is a length of coiled tubing as shown, and is provided with either 12 inches or 60 inches of capillary tube. The 60-inch length is standard.

NEW EASTERN REPRESENTATIVE FOR MILLS NOVELTY CO.

B. B. DAWES has been appointed Eastern Manager of the Commercial Refrigeration Division of Mills Novelty Company, Chicago. The territory under Dawes' jurisdiction is comprised of New York, Philadelphia, Baltimore, and Washington. Mr. Dawes was formerly manager of the refrigeration and air conditioning division of the H. Channon Company, Chicago.

B. B. Dawes (left), newly appointed Eastern Manager, gets a welcoming hand from Ray Polley, Commercial Refrigeration Sales Manager, at Mills Novelty Co.

NEW CATALOGS AND BULLETINS

DETROIT LUBRICATOR COMPANY—Catalog No. 100, on automatic controls and equipment for lubrication and all types of heating, refrigeration and air conditioning, 36 pages. Write the manufacturer at Detroit, Mich.

HARRY ALTER COMPANY—The spring issue of Dependabook is now being mailed to dealers and servicemen who are on their mailing lists. This latest catalog has been greatly augmented with new items taking into consideration all supplies, tools, and equipment for refrigerators, as well as air conditioning. Write 1728 S. Michigan Ave., Chicago.

REPAIRING HERMETICS

E. E. CONDON

WITH the trend of household refrigerators taking a turn towards semi-hermetic and hermetic units, it was a step forward on the part of Flushing Refrigeration Company, Ernest E. Condon, prop., of 133-22 41st Avenue, Flushing, N. Y., to fully equip their shop to handle hermetic repair work in a 100 per cent way, although the Flushing Refrigeration Company have been doing hermetic work for the past four years, at no time have they been so completely equipped to cope with the present demands for this special type of rebuilding and repairs as at present.

When a unit comes in the shop for repairs, first it is put on the test bench to analyze the cause of non-operation. This procedure takes place regardless of what the complaint may be, or what the customer may claim is the trouble with the unit.

If it is found in testing that the unit must be cut open, it is then hooked up to the evacuator, all remaining refrigerant and oil removed from the system; next the evaporator is disassembled from the compressor, which is placed into the lathe and cut open. After cutting open, the compressor is returned to the bench and disassembled, each part is carefully examined for defects, defective parts are reoperated if possible; if not, replacement parts are put in place. Condensers, domes, and bases are thoroughly cleaned by a boiling process, then removed to a dehydrating oven where they are dehydrated for a period of hours.

After proper dehydration of all parts, plus insertion of replacement parts to be made, the unit is ready for reassembling. This procedure having been made, the unit is now ready for welding (in case of a welded job). After welding, the unit is completely assembled (compressor and evaporator). All soldered joints are silver soldered.

Returning the unit to the evacuating bench, it is then put under a pressure of 100-150 pounds of air for leaks. No leaks being found, unit is started up. Each unit must pull a vacuum of 28-30 inches on the low side, against a pressure of 80-140 pounds on the high side of the system, before the stamp of approval is placed upon it by either Mr. Condon or Mr. Barnard, manager of Flushing Refrigeration Company.

Next step in line is the baking and dehydration of the unit while under a vacuum of 30 inches. This procedure takes on an average of eight to sixteen hours. Completely dehydrated the unit is now ready for recharging. Having been properly recharged the unit is now placed into a test cabinet, where a careful record of cycles are noticed and recorded. All tests having proven satisfactory, the unit is now moved into the spray booth, where it is refinished. Being thoroughly dried the unit is placed in the proper rack to await crating or delivery.

The Flushing Refrigeration Company's shop equipment consists of the following: two lathes, one a bench, one a nine foot capable of swinging 37 inches of work in the chuck; a 1½ h. p. U. S. air compound compressor which is piped throughout the shop, and furnishes air for testing, blowing, plus feeding two guns in the spray booth, which are throttled with controls for a 50 pounds constant pressure; one ½ h. p. evacuator piped and controlled with valves to handle eight units at one time while discharging gas or pulling a vacuum; bake oven; electric welding outfit; acetylene burning and brazing outfit; charging panel; small oven for evaporators; bench grinders; drill press; electric drills; cleaning pit for units and parts.

The stock room is well supplied with parts to handle most any make electric refrigerator in use today. Aside from hermetic work the Flushing Refrigeration Company enjoys a very nice income from commercial and domestic work.

Mr. Condon is the inventor of and partner in the C-Y Mfg. Co. of Jamaica and Flushing, N. Y., who hold two patents on and manufacture the C-Y Universal purging and charging tool, which is used on most all refrigerators where a special charging and purging valve must be attached to complete repairs.

Due to increased demands for their services the Flushing Refrigeration Company has had to move to new quarters three times in as many years, each time increasing their floor space. Mr. Condon attributes increasing business, even at this time of year, to a policy he put in force years ago, namely that to build up customer good will: First, throw the policy of cheapness out of your organization; second, by giving the customer more than he expects; and always do a 100 per cent job as near as possible to factory specifications. With these principles in mind business cannot help but increase.

REFRIGERATION SERVICE ENGINEERS' SOCIETY

Official Announcements of the activities of the National Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

ASSOCIATION HEADQUARTERS: 433-435 North Waller Ave., CHICAGO, ILL.

Buffalo Starts Planning for 5th Annual Convention

PLANS are in the making for the annual convention in Buffalo, N .Y., on November 2, 3 and 4, 1938.

The Statler Hotel will be the official convention headquarters and will accommodate the meetings of the Society and the manufacturers' exposition on the entire 17th floor. Space charts showing the convention layout and plan of the manufacturers' exhibit will be in the hands of all manufacturers very shortly.

Buffalo will offer many attractions for the visiting delegates and plans are being made to provide the most interesting convention the Society has ever conducted.

Buffalo is the farthest eastern city in which the annual convention has been held.

Niagara Frontier Chapter of Buffalo will be the convention host and is inviting the cooperation of the other eastern chapters in contributing to the success of this annual meeting and exhibit.

Manufacturers whose products and interests are directed to the refrigeration service engineer will find this annual convention the focal point of the entire service industry.

Four New Chapters Apply for Charters

WILKES-BARRE, PA.

A GROUP of servicemen, who have been desirous of affiliating with the National Society, have petitioned for a charter for a local chapter at Wilkes-Barre, Pa. Plans will be made for future meetings, and the formal election of officers. The members to sign the petition comprise the following:

J. H. Brenner
J. J. Cusick
T. O. Miller
F. M. Schultz
L. E. J. Harris
J. E. Kline
C. Lewis
E. E. Swank
H. Williams
G. Yatsko
W. E. Martin

DES MOINES, IOWA

ON February 7, through the courtesy of the Dennis Refrigeration Supply Co., of Des Moines, Iowa, a meeting was held at their show room to consider the establishment of a local chapter at this point.

Mr. S. A. Leitner, national treasurer of the Society, was in attendance to explain the purposes and objects of the organization, and a successful chapter was started, with 29 members signing the petition for charter. The following are the charter members:

H. M. Anderson	C. B. Herbert
C. E. Baker	C. R. Jones
L. C. Bennett	E. J. Kerby
J. F. Boyd	E. A. Laverrenz
W. K. Brand	W. F. Millinacker
H. R. Brewster	A. J. Milliron
O. L. Colegrove	A. R. Mulhern
L. W. Cox	P. R. Parish
F. Crockett	J. R. Reid
T. J. Danzer	H. D. Rollins
C. W. Dennis	A. H. Siefken
J. W. Fehrs	E. M. Snyder
D. Gasper	E. R. Stuart
R. Heinze	B. F. Wood

B. Wright

Mr. B. F. Wood was elected *Temporary President;* Mr. E. A. Laverrenz *Temporary Secretary;* and Mr. Dave Gasper, *Temporary Treasurer.*

WICHITA, KANSAS

A GROUP of ten service engineers, meeting in Wichita, Kansas, filed a petition for charter to affiliate with the National Society. Arrangements will be made for the completion of the details of this charter at an early date. The following members signed the charter petition:

J. E. Ambler	E. L. Rankin, Jr.
F. C. Fiedler	E. F. Rhodes
G. B. Govits	F. H. Richards
H. P. Leeper	F. W. Ryan
L. A. McBride	C. E. Soderberg

BIRMINGHAM, ALA.

ANOTHER chapter for the South! Birmingham, Alabama, is the newest chapter from the South to apply for a charter from the National Society. A progressive group of servicemen, consisting of the following, have signed the charter petition:

E. L. Gentle	G. D. Maske
E. D. Gothberg	B. H. Meadows
R. W. Gray	L. Nalley, Jr.
C. N. Hughes	S. Nelson
W. C. Kent	D. B. Sessions

R. S. E. S. Past—Present—Future

By WARREN W. FARR, Cleveland, Ohio

MANY organizations in determining their future policies, consider it wise to look into their past successes and failures.

Today R. S. E. S. is faced with several problems. In order that we may continue onward as rapidly as we have in the past five years, it is necessary that these problems be wisely solved. Let us hurriedly scan our past, so that we may profit from our experience.

In 1934 we held our first convention in Chicago. The meeting place was the Chicago Chapter Room. At this meeting there was a small disorganized group, making plans for the future. The enthusiasm of this small group contributed largely to the success of the R. S. E. S. The Detroit and Chicago chapters were by far the largest groups in attendance and due to this fact, Detroit was selected as the next convention city.

In 1935 R. S. E. S. held its first successful convention in the city of Detroit. Manufacturers were well pleased with attendance at their exhibits and due to lack of space, several manufacturers were unable to exhibit. At this convention there appeared a new group of men from the South who were bubbling over with southern hospitality and the desire to bring the next convention to Memphis. They were awarded this convention because they were hard workers and made the greatest effort to obtain it.

In 1936 the R. S. E. S. conducted a well planned convention in Memphis at which many new chapters made their initial appearance. The attendance at this convention was less than it should have been due to the time and expense necessary to travel this distance from largely populated areas. Some of the exhibiting manufacturers also commented on their additional expenses. The first growing pains of this organization were experienced when a new Constitution and By-Laws were proposed. Many chapter cities bid for the 1937 convention and much rivalry was experienced. Conforming with the Constitution and By Laws, the Board of Directors were charged with the responsibility of selecting the convention city.

Profiting by past experience their se-

lection would be based upon the location which would attract the largest attendance possible and provide adequate facilities for the holding of a successful manufacturers' exposition. Invitations from the various cities who desired to act as hosts for each convention would be thoroughly considered by the Board of Directors. This method of selection would preclude any possibility of the convention being held in cities too far distant for a successful national convention.

At Chicago, in 1937, R. S. E. S. staged an extremely well planned and well attended convention. The advisability of holding conventions in the cities near the widely populated areas was well proven by the success of the Chicago convention. The assembled group was again pleased to receive information that their membership had increased considerably since the Memphis convention and that a concerted membership drive would take place after the Chicago convention. Growing pains were again experienced both within and without the organization. From without, came discussions on the manner in which R. S. E. S. made their selection of convention city and the manner in which they spent the money received in convention exhibits. Again these growing pains were an indication of a healthy condition, as they created a necessity for cooperation between the R. S. E. S. and the manufacturers' and jobbers' association.

Membership Increasing

At the present time the R. S. E. S. is increasing its membership and will continue to hold conventions each year. It will continually strengthen its prestige in the refrigeration industry.

Many sacrifices have been made by this group in bringing the organization to the standing it now enjoys. Many of these sacrifices have been personal ones, suffered by individuals who spent much of their time to further the interests of the society when their own businesses needed their undivided attention.

In view of these facts the R. S. E. S. will never consider combining their interest with other groups of the refrigeration industry which would swallow them up and eventually make them a small cog in a large machine. R. S. E. S. has proven that they are leaders and leaders they shall always be.

The Society realizes that the manufacturers and jobbers are a very necessary part of our organization and our conventions, and most of the refrigeration service engineers agree that the manufacturers' and jobbers' wishes and suggestions are cordially and sincerely invited for due consideration. It is necessaary, therefore, that a spirit of cooperation be shown by all the interested parties and that joint committees and joint boards meet and together decide the wisest paths to travel to a successful future.

It has been rumored that due to the fact that the manufacturers put up all the money necessary to successfully carry on the convention by purchasing exhibit space, that they should operate their own exhibits; determine by themselves the location of these exhibits or in other words—in the future—hold a manufacturers' show. The other side to the question is as follows:

Each member of the R. S. E. S. makes an investment of time and money to attend their annual conventions. The total investment made by these service engineers is a considerable investment. The R. S. E. S. is solely responsible for these annual meetings to date, and by this token, deserves the right to participate as leaders in all future conventions, it being understood that cooperation between these three groups is necessary for the betterment of each.

The future of the refrigeration industry holds many great possibilities. If the component parts of this great industry go forward hand in hand, our advancement will be far more rapid than it would be if we hesitate at this point.

R. E. Gibson,
Texas.

It is a pleasure to read your magazine, THE REFRIGERATION SERVICE ENGINEER. I find many helpful things in it which we do not get in any other magazine. The Question Box is very interesting, and we enjoy it very much. The February issue "hit the spot" about methyl chloride.

I have a special file for THE REFRIGERATION SERVICE ENGINEER, and think more of it than—well, I just can't find words to tell you how much.

A. C. Rorer
Pennsylvania

I find your magazine very interesting and helpful. I am only sorry I did not subscribe sooner, as back copies would have given me much needed information.

EDUCATIONAL RESEARCH BY PITTSBURGH CHAPTER

IN order that educational programs and discussions may follow a definite prearranged line, Mr. Nelson D. Wagener, chairman of the Educational Committee of the Pittsburgh, Pa., Chapter, has inaugurated the system of preparing for each meeting, a mimeographed outline of the discussion, and presenting it to the members at the meeting. Through these papers, a definite program is followed, and an assured amount of progress is made during each discussion.

One of these papers on the subject of "Blower Coils," as prepared for a recent meeting, follows:

Blower Coils—Forced Draft Coils, Unit Coolers, Humi-Temp Blowers.

Applications—Walk-in Coolers for Meat and Produce, Walk-in Coolers for Milk and Beverage cooling, Reach-in Boxes.

Display Cases.

Any fixture that does not have sufficient room for finned coils.

Special applications for candy manufacturing, etc.

Room cooling.

If blower is too small for application, it will be necessary to operate at too low a back pressure and ice will form on the fins and dehydration will result. Fixture temp. will rise if excessive ice forms on coils.

If blower is slightly over size, the temp. may be brought down as low as 30 degrees without too much ice forming.

Do not install a blower with a C.F.M. rating greater than 1½ times the cubic foot area of the cooler or fixture.

Calculation of Compressor—Calculate compressor size so that a high back pressure can be maintained to produce proper temperature in the fixture.

If too large a compressor is used, too low a back pressure must be maintained to produce proper temp. in the fixture.

Too low a back pressure will cause short cycling and oil scrubbing.

Control—Continuous operation of fan motor is advisable.

Thermostatic control of fan motor complicates operation and adds to service problems.

Control compressor with pressure control.

Some engineers advise installation of constant pressure valve in suction line and control system by means of solenoid in liquid line and room thermostat.

SERVICE SUMMARY

SYMPTOMS	CAUSES	REMEDY
High Temperature	Too low back pressure	Re-adjust valve.
	Too small blower unit	Install proper unit.
	Too small compressor	Install proper unit.
	Shortage of refrigerant	Recharge.
	Improper control adj.	Re-adjust.
Ice on blower	Too low back-pressure	Re-adjust valve.
	Short cycle	Re-adjust control.
	Shortage of refrigerant	Re-charge.
Short Cycle	Too large compressor	Reduce comp. speed.
	Shortage of refrigerant	Re-charge.

Operation—Blower coils have a little greater tendency to cause dehydration than do regular finned coils. This can, however, be overcome if blower and compressor are of proper size.

Blower coils may be used for temperatures as low as 10 degrees if provisions for defrosting are made.

Calculation of size of Blower—Figure requirements so that Temperature difference will not be too great between refrigerant and desired fixture.

* * *

R.S.E.S. NATIONAL COMMITTEE APPOINTMENTS

PRESIDENT W. H. MOSS has announced the following National committee appointments:

Unit Labor Survey Committee—*Chairman*, Mr. Paul B. Reed, Evansville, Ind.

Trade Relations Committee—*Chairman*, Mr. George L. Uetz, Memphis, Tenn.

Uniform Symbols Committee—*Chairman*, Mr. Joseph Askin, Buffalo, N. Y.

Uniform Cost Accounting Committee—

LOS ANGELES CHAPTER OFFICERS—Seated, left to right—G. R. McLay, 2nd vice-president; W. W. Allison, president; K. Van Henderleider, 1st vice-president. Standing—E. L. Glaser, director; E. K. Fosbender, director; C. D. Weierman, sergeant-at-arms; J. E. Salisbury, chairman of Entertainment Committee; John Lewis, secretary; T. E. Lawler, director; J. C. Rodgers, treasurer; J. H. Underwood, director; J. C. Blair, director, and chairman of the Educational Committee.

Chairman, Mr. Harry Drownes, Chicago, Ill.

Dehydration of Refrigeration Equipment and Systems—*Chairman,* Mr. Warren W. Farr, Cleveland, Ohio.

Membership Committee—*Chairman,* Mr. E. A. Plesskott, St. Louis, Mo.

Manufacturers Contact Committee—*Chairman,* H. T. McDermott, Chicago; W. H. Moss, Memphis, Tenn.; C. P. Eich, Youngstown, Ohio.

LOS ANGELES CHAPTER

Meeting of February 11, 1938

By L. P. ROTH
3109 Beverly Blvd., Los Angeles, Calif.

ON February 11th, the second regular meeting of Los Angeles Chapter was held at Scully's cafe. The meeting was preceded by a dinner at 7:00 p. m., attended by ninety-four members and guests, including eighteen men from Long Beach Chapter.

Entertainment was provided during the dinner through the courtesy of the AAA Electric Company of Los Angeles. At the conclusion of a brief business meeting following the dinner, Mr. J. C. Blair, Educational Committee chairman, introduced Mr. A. B. Schellenberg of the Alco Valve Company of St. Louis, who spoke on the subject of "Thermostatic Expansion Valves."

Mr. Schellenberg illustrated his lecture with a number of very interesting slides, and also a glass evaporator, furnished through the courtesy of the Alco Valve Company. By the use of the evaporator, which is very cleverly designed, top feed, bottom feed and vertical feed can be obtained at will. Mr. Schellenberg had some very interesting information regarding data obtained through tests on this evaporator with different types of feed, and much of this data was illustrated by the evaporator at the close of the lecture.

LONG BEACH CHAPTER

Meeting of January 24, 1938

By R. L. DARBY, *Chairman, Publicity Committee*
121 Elm Ave., Long Beach, Calif.

PRESIDENT L. S. GOULD presided at the January, 24th meeting. Members of the following committees were appointed by President Gould: Investigation, Membership, Publicity, Educational and Program, Finance Committee.

The subject of exchange of credit information among the members was discussed and final decision as to definite ways and means of handling the matter was held over until a later date. Mr. E. T. Hogan, chair-

VIEWS OF THE LOS ANGELES CHAPTER MEETING AT SCULLY'S CAFE—1—The Alco evaporator doing its stuff. 2—W. W. Allison, president, takes the chair. 3—A. L. Ingraham explains the Alco evaporator. 4—Part of the crowd. 5—C. A. Swanson, left, chairman of the meeting, and Ralph E. Crowley, Boulder Schoolfill Co., A. R. A. representative.

man of the Finance Committee, was authorized to investigate and recommend proper procedure.

Mr. R. L. Darby gave a brief summary of his activities with the local Apartment House Association in regard to their approval of the new refrigeration code which we are sponsoring.

An invitation from the new Los Angeles Chapter, now under formation, was read to the members, to attend their next meeting, and which was accepted.

After adjournment, a buffet luncheon was served by Mr. Darby.

February 11, 1938

Twenty members of Long Beach Chapter went to Los Angeles in a body to attend a banquet given by the new Los Angeles Chapter. The following item appearing in the Long Beach Press Telegram of February 13th furnishes the details:

"Long Beach Chapter of the Refrigeration Service Engineers Society will meet Monday evening at 8 o'clock at 121 Elm Avenue. A factory representative of the Peerless Coil Company of Chicago will speak. The meeting will be open to all refrigeration contractors, engineers and service men, whether members of the association or not, without charge.

"More than twenty Long Beach members of the Refrigeration Service Engineers Society were guests of the Los Angeles members at a banquet Friday night at Scully's Cafe, 48th Street and Grenshaw Boulevard. Short talks by L. S. Gould and R. L. Darby of the local organization preceded a lecture by Mr. Schellenberg of the Alco Valve Company of St. Louis, who demonstrated with a glass refrigerating unit and pictures."

Meeting of February 14, 1938

All business was suspended and the meeting turned over to Messrs. Knoll and Bretag of Peerless of America, Inc., who gave very splendid talks and demonstrations of Peerless coils and expansion valves. The Peerless rifled expansion coils and the new "Porcupine" coil were shown and attracted wide-spread interest. The meeting adjourned at 10:30 p. m. and was followed by thirst-quenching refreshments.

Announcement was made that the next regular meeting would be a closed meeting, but that a special meeting would be held on Friday, March 4th, at which a factory representative of the Detroit Lubricator Company will be present and conduct the educational features.

THE "CONTRIBS' COLYUM"

By **THE KINGFISH**

WELL, so it is going to be Buffalo in 1938. It sure was a relief to know just what we are going to do this fall and I am sure that we all think of going to Niagara Falls when we get to Buffalo. We should also like to see the Fedders Mfg. Co.

It is rumored that several of the members of the Central Indiana Chapter are quarantined due to smallpox in their respective families. We hear that Paul Jacobsen tried hard to get it, but the vaccination did not take.

Pleasant surprise No. 7819. The secretary of the St. Louis chapter presented his secretary (alias his wife) with a Karat diamond for Christmas. That man must be a student of psychology. We wonder if this diamond was payment for her past performances as his secretary or whether it is an advance payment for the work she will encounter now that he is chairman of the National Membership Committee.

Incidentally, Mr. E. A. Plesskott, who is the new chairman of the National Membership Committee, requests our help and your help this year so that the Society may have a successful year as far as membership increase is concerned. We think a lot of "Pless" as does everyone who is acquainted with him, and we know he will do some real work to help your chapter increase its membership, but, of course, he cannot do it all alone. It takes the combined effort of all the various membership committees to get results and I know you will not regret working with "Pless." What do you say that we all write him a letter now? Let him feel that he has a job to do and a lot of fellows are ready to help him. He is a "hound" for correspondence so write him for instructions now. Address: 2145—67th St., St. Louis, Mo.

Attention "Shadow," Chicago Chapter. Consider this an invitation to make frequent use of this column for news and scandal from your territory. Address: *The Kingfish*, 433 N. Waller Ave., Chicago, Ill.

The unconfirmed news of last month, that one of our former National Officers was elected a deacon in his church has neither been confirmed nor denied to date. The lat-

est report is that he was elected President of the Board of Deacons. Apparently though, the road to reform is a difficult one. We hear that he is threatened with a report to the church because he was seen in a tavern drinking beer after one of the board meetings tch! tch!

C. O. McCauley of the Board of Directors went to Toledo, Ohio, to present the charter to Toledo chapter. Congratulations, A. J. King, president and H. C. Benington, secretary.

Steve Leitner is working on the formation of a new chapter in Des Moines, Iowa. Subsequent reports advise us of the start of a successful chapter at that point, with our old friend B. F. (Woody) Wood as president.

Between all the new air conditioning and garden-seed catalogues which are making their appearances now we have plenty of interesting literature to read these evenings.

February has been a banner month for new chapters—Wilkes Barre, Pa.; London, Ont., Canada; Wichita, Kans.; Birmingham, Ala.; Des Moines, Iowa.

We learn as this issue goes to press of a successful full day meeting held at Davenport, Ia., under the sponsorship of the Republic Electric Co. More news about this meeting in the next issue.

President W. H. Moss of Memphis and board member Chas. Eich of Youngstown, Ohio, journeyed to Chicago recently to attend a meeting of the manufacturers R.S.E.S. contact committee.

ONTARIO MAPLE LEAF CHAPTER

Meeting of January 28, 1938

By H. F. NYE, *Secretary*
80 Ontario St., Toronto, Ont., Can.

THE meeting was called to order, with all officers present.

Mr. Sinclair Moffat of the Canadian Westinghouse Company gave an instructive talk on the subject of air conditioning, a subject with which he is well qualified to deal. Mr. Moffat is chairman of the Educational Committee of the chapter.

In view of the fact that the membership renewals had not yet been completed, it was decided to postpone holding of the banquet until some time in March, instead of Febru-

FOR COMMERCIAL USE

Mills Compressors

★ Mills Novelty Company
4100 Fullerton Avenue, Chicago, Illinois

SOLD ONLY THROUGH SERVICEMEN, DEALERS, AND DISTRIBUTORS

ary, as previously suggested. Mr. McKee suggested that his committee be given until next regular meeting night to get all renewals lined up.

Under "good and welfare of the Society" Mr. McCracken announced that after March 24th the term "engineer" could not be used after the name of an individual not a member of the Professional Engineers Society. Since there is a fine of $100 for any infringement of the act, he advised all members of the chapter to govern themselves accordingly.

A letter was read by the President from the newly formed London Chapter, expressing appreciation of the assistance of this chapter in forming their local chapter. Mr. G. A. Burns read a report of the meeting in London, which he attended, as a member of the National Board of Directors. He was accompanied on the trip by Mr. A. E. Doan of the Ontario Maple Leaf Chapter.

Mr. W. Bevis of the London Chapter spoke briefly of the progress made in the formation of the new chapter.

Mr. J. H. Stoliker spoke for a few minutes of interest in the formation of a local chapter in Hamilton, Ontario, and was informed by Mr. G. A. Burns of the necessary steps to take in the formation of such a chapter.

\$ \$ \$

NOVEL CHARTER FRAME DESIGNED BY E. J. STORM

A WOODEN frame didn't seem appropriate for the charter of the St. Joseph (Mo.) Chapter, so E. J. Storm, 2815 Felix Street, took his tools in hand and turned out a novel and ornamental border made of copper tubing and sheet iron from an electric icebox.

Storm, who is president of St. Joseph Chapter used a piece of sheet iron for the back of the frame. He used copper tubing five-eighths of an inch in diameter to form an oblong border for the sheet iron. He bent tubing one-fourth inch in diameter to form the letters "R," "S," "E," "S," and placed them at the top of the frame.

For the ornamental border, Storm shaped tubing three-eighths inch in diameter into scroll-like figures. About twenty-five feet

NEW SERVICE VALVE KIT FOR HERMETIC UNITS

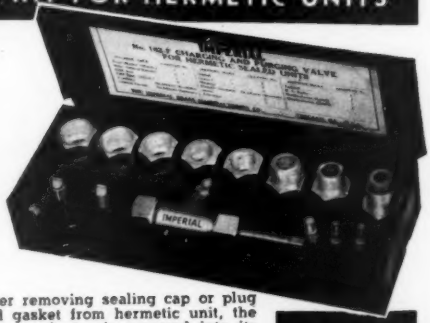
. . . for purging, charging and testing

THIS KIT contains a special valve with adapters and keys for use on hermetically sealed condensing units for purging, charging, testing, etc. It eliminates the need for having a number of different service valves for use with the various makes of such equipment.

Eight different adapters are supplied for attaching the service valve to the different units, and 5 keys are supplied which will fit the different charging plugs found on these units, these plugs generally having recesses of various sizes and shapes. Adapters have numbers stamped on them for easy identification and label inside box shows which adapter to use on each machine.

The valve kit can be used with the following hermetic units: Bohn methyl chloride and sulphur dioxide; Coldspot; Frigidaire; General Electric; Gibson; Grunow Majestic; Servel; Television; Trukold; U.S. Radio; Westinghouse large and small.

Operation of this valve is simple.



After removing sealing cap or plug and gasket from hermetic unit, the proper adapter is screwed into its place, the proper key is fitted to the charging plug, and the service valve is attached to the adapter. The unit is then ready for purging, charging or testing. Operated by ordinary ¼" ratchet wrench.

The outfit, which in addition to the special valve includes 8 adapters, 5 keys and 4 gaskets, is furnished complete in a convenient, specially-fitted metal box.

No. 182-F Service Valve Kit for Hermetic Units Dealers Price $8.00 ea. Net

ORDER FROM YOUR JOBBER

Imperial Brass Mfg. Co., 1204 W. Harrison St., Chicago

IMPERIAL Air Conditioning and Refrigeration Products

VALVES • FITTINGS • TOOLS • CHARGING LINES • FLOATS • STRAINERS • DEHYDRATORS

The Charter Frame Designed and Built by E. J. Storm

of the tubing was used in making the border. The entire frame is about thirty inches high and twenty-five inches wide. The frame will be displayed in a downtown store window soon.

INDIANAPOLIS CHAPTER

Meeting of February 8, 1938

By **J. A. SALTER,** *Secretary*
3607 E. Michigan Street, Indianapolis, Ind.

PRESIDENT J. O. CUMMINGS called the meeting to order.

The Entertainment Committee reported all arrangements made to have the biggest and best dance ever held by the chapter. Motion was made and carried that we extend invitations to Paul Jacobsen and National Secretary H. T. McDermott to attend.

Motion was made and carried that we extend invitations to chapters at Dayton, Louisville, Central Indiana and Cincinnati to attend our next and special meeting on February 15th to hear Mr. George H. Clark of the Detroit Lubricator Co. give a talk on their products.

President Cummings gave a speech when he presented Mr. R. C. Robinson with a pen and pencil set for obtaining the most new members in 1937.

Meeting of February 15, 1938

Indianapolis Chapter had one of its largest and finest meetings when Mr. George H. Clark, chairman of the National Educational and Examining Board and refrigeration engineer for the Detroit Lubricator Co., addressed the meeting, comprising some

ROTARY SEAL COMPANY
Mechanical Seals for Rotating Shafts
LICENSEE COOKE PATENTS

CABLE ADDRESS: ROTOSEAL
GENERAL OFFICES-MID CITY BANK BLDG.
808 W. MADISON STREET
CHICAGO · ILLINOIS

February 17, 1938

Mr. H. T. McDermott
% The Refrigeration Service Engineer
433 North Waller Ave.
Chicago, Ill.

Dear Mr. McDermott:

We read the letter you published in your Question and Answer Department in the February issue of your magazine on lapping seals, outlining the experience of a service engineer. Even though there is a doubt in the mind of this service engineer as to the real cause of the trouble, still it appears he was conscientious in giving his version of the difficulty.

Everybody knows that mistakes will occur, even in the best regulated factories, as the human element is never infallible. A great number of seals pass through our factory daily and despite the many precautions we take, still it is apparently inevitable that once in a while an imperfection will slip by unnoticed.

It is the policy of our company to manufacture shaft seals as nearly 100% perfect as is possible. Our guarantee to the service engineers is that Rotary Seal Replacement Units are in every way standard in workmanship, material, and performance, and we stand back of them 100%. For many years we have been serving a steadily growing list of service engineers, which proves that our shaft seals are doing what we claim for them.

We aim to eliminate all mistakes possible and we feel very grateful when they are called to our attention. We always want our customers to let us know at once when anything is wrong and nothing could please us more than to have them write us or you in a frank manner, as we will always welcome constructive criticism.

Cordially yours,

ROTARY SEAL COMPANY
By Geo. P. Gilman
President

Geo.P.Gilman:LG

seventy-two service engineers in attendance.

Mr. Clark gave a very practical talk on the thermostatic expansion valve.

TOLEDO CHAPTER

Meeting of February 16, 1938

By H. C. BENINGTON, *Secretary*
139 N. Erie St., Toledo, Ohio

THIS meeting was held at Redman's Hall at 3368 Monroe Street, Toledo.

Following the regular business of the meeting, the election of permanent officers was conducted, with the following results: Mr. A. J. King, *president;* F. A. Rudolph, *vice-president;* H. C. Benington, *secretary-treasurer; Board of Directors:* R. E. Dunlap, R. S. Angell, A. J. King, F. Rudolph, D. McGinley, C. N. Bordner, H. C. Benington.

An Educational Committee was appointed, consisting of Messrs R. E. Dunlap, F. Rudolph and H. C. Benington.

Messrs. T. R. Benington, E. M. Gresham and E. L. Cripps were appointed to serve on the Entertainment and Membership Committees.

An educational talk by Mr. O. Nelson of the Riley Engineering Company of Detroit, Michigan, followed the business session.

ST. LOUIS CHAPTER

Meeting of January 27, 1938

By E. A. PLESSKOTT, *Secretary*
2145 67th St., St. Louis, Mo.

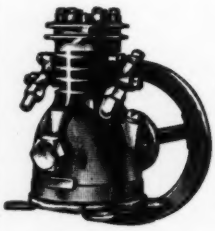
THIS open meeting was called to order by President L. Vollman.

Mr. Vollman outlined briefly the reason for the Society's existence and invited any of the one-hundred-and-twenty-five visitors present to see the Secretary at the close of this meeting should they desire any additional information.

He then introduced Mr. R. W. Hoffman, sales manager of the St. Louis branch of the Johns-Manville Company, who explained briefly the history of his company and its products, together with the obstacles that were encountered and overcome during the filming of the presentation "Heat and Its Control" that was about to be shown.

At the conclusion of the showing, Mr. Hoffman thanked the chapter for having been given this opportunity to meet with us and invited those present to view the samples of his company's products which were on display and help themselves to one or both of the interesting booklets that were available.

Mr. Vollman, before closing the meeting,



"Chieftain" Quality Built Compressors and Condensing Units

are designed to give you many years of quiet, efficient and trouble free service by Engineers who have been serving the refrigeration industry for the last fourteen years.

They have again "scored a hit" with a new "V" type four cylinder compressor which is designed for use with ½ to 1 HP motors. All of the advanced features that have proven so successful in "Chieftain" household and light commercial units are now incorporated in this new four cylinder model.

Mechanical improvements include, force feed lubrication to piston pin and connecting rod bearings, positive alignment of cylinder bores with main bearings by casting cylinders and crankcase in one piece. Adjustable suction shut-off valve, interchangeable parts with single and twin cylinder models. All compressor parts are machined to precision limits on up to date equipment and assembled in glass enclosed rooms where only filtered, dust free air is admitted.

Write for our latest descriptive catalog

TECUMSEH PRODUCTS CO., Refrigeration Division TECUMSEH, MICH.

explained that we have tentatively made arrangements to have with us on Thursday, February 10th, Mr. E. H. McGovern, of the R. & H. Chemicals Company, and inasmuch as this would be a closed meeting, if there were any individuals interested the Secretary would be glad to accommodate them with invitation cards.

MADISON CHAPTER

Meeting of February 1, 1938

By **PHIL NOTH**, *Secretary*
Route 1, Madison, Wis.

THE meeting was called to order at 8:15 by President Meade Robertson.

Mr. R. Anderson of the Imperial Brass Mfg. Company was introduced. He gave a very educational and interesting talk on new tools and equipment being put out by his company: namely, a new type of wheel puller, a new unit for servicing hermetic units of all kinds, new bending tool and flare tool. He answered a number of questions that were brought up by the members.

Through the generosity of Mr. G. A. Larson, door prizes were awarded to the following: Mr. Balthazar received a tube cutter; Mr. H. Hill, a pinch-off tool; and Mr. Roy Hoffman, a junior tube cutter.

Mr. Larson then said, "Bring on the eats," and the eats really came—platters of meat and cheese, baskets of bread and bowls of potato salad; also a small barrel of beer and coca cola for those who did not want beer.

Meeting of February 15, 1938

Announcement was made that Professor Royce A. Johnson of the University of Wisconsin Electrical Standards Laboratory would be the speaker at the March 1st meeting of the chapter.

In place of the question box, Mr. Robertson used the latest copy of the Official Organ and read questions and answers from it pertaining to the moisture problem in a methyl chloride system. He also read a humorous article by Arthur "Bugs" Baer taken from Refrigeration News entitled, "Farewell to the Old Wooden Icebox."

Mr. Larson, as chairman of the Educational Committee, then introduced Mr. G. C. Taylor of the Kerotest Mfg. Company, who was the speaker of the evening. Mr. Taylor had a large diagram of the Kerotest Packless Valve and also a sample valve with the various parts all loose which he passed

Snap-on

SPECIALIZED TOOLS FOR REFRIGERATION SERVICE

• Four wrenches in one—that's why it's so handy! Used for various sized valve stems, couplings and general all-around refrigeration service work. Complete with all Snap-on features, such as ratcheting ends that speed action and handy reversing trigger. Square openings 3/16", 1/4" and 3/8". Hexagon opening 1/2". Middle part is drop forged and ratcheting ends are made from hardened steel plates with accurately milled gears. Wrench easily cleaned of dirt and old gumming oil by washing in gasoline.

SNAP-ON TOOLS CORP.
KENOSHA, WIS.

SPECIAL REFRIGERATION WRENCH

SNAP-ON TOOLS CORPORATION
Kenosha, Wis.
☐ FREE Literature on Refrigeration Tools.
☐ Show me Ratchet B3801.
Name .....
Address .....
..... RSE-3

among the men for their inspection.

Mr. Taylor also distributed catalogs and discussed and explained intimate facts concerning all parts and fittings manufactured by his company.

After several questions and answers on Kerotest merchandise, Mr. Taylor very generously furnished plenty of beer for everyone present. Several decks of cards were brought out and the entertainment part of the evening continued until the "wee" hours.

TWIN CITIES CHAPTER

Meeting of February 9, 1938

By **B. J. DeLANGE,** *Secretary*
Como Station, Route 3, St. Paul, Minn.

THE meeting was called to order by President A. G. Larson.

Mr. McCrea of the Detroit Lubricator Company was introduced and asked for a future date to give a lecture on expansion valves in regard to their proper application and use.

Mr. C. A. McCafferty, Educational Committee chairman, gave a lecture on evaporative condensers. He also gave a complete explanation on why methyl chloride or "Freon" should not be used in any machine having aluminum parts or pipes.

INDIANAPOLIS AUXILIARY

Meeting of February 16, 1938

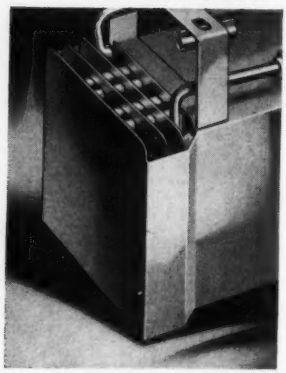
By **MRS. R. S. HOLBROOK,** *President*
5103 Ellenberger Ave., Indianapolis, Ind.

AT the first meeting held December 1st to discuss the organizing of the Ladies Auxiliary, plans for the election of officers were discussed and a decision was reached to have the next meeting for that purpose, to be held Thursday evening, January 11th, at the Lincoln Hotel.

The January 11th meeting was opened by Mrs. R. K. Duncan, temporary chairlady. Minutes of the previous meeting were read and approved, and election of officers followed. Those elected were: Mrs. R. S. Holbrook, *president;* Mrs. R. K. Duncan, *vice-president;* Mrs. G. Wampner, *secretary,* Mrs. R. Robinson, *treasurer.* The Financial Committee appointed by the president consisted of Mrs. A. Brandlein, Mrs. J. Salter and Mrs. D. Gerrard.

Following the election of officers, the time and place for future meetings, dues, etc., were discussed. A freewill offering to be taken up at each meeting for the purpose of maintaining a "kitty" from which to purchase small items such as stationery, etc., was agreed upon.

~ *The Power Pack Of Refrigeration* ~



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PEERLESS "HUMIDI-PACK"
HOUSEHOLD EVAPORATORS
HAVE IT

This cartridge fin type of refrigeration power element is found only in Peerless "Humidi-Pack" Household Evaporators.

"Humidi-Pack" sets up a beneficial downdraft air circulation so necessary to better food preservation. It maintains correct humidity conditions in the refrigerator at all times.

"Humidi-Pack" is better. Write for information.

PEERLESS of AMERICA, Inc.

ESTABLISHED IN 1912 AS THE PEERLESS ICE MACHINE CO.

New York Factory
43-20 34th St.
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MAIN FACTORY: GENERAL OFFICES
515 West 35th St.
CHICAGO

Pacific Coast Factory
3000 S. Main St.
Los Angeles

Peerless Jobbers in all Principal Cities

The meeting of January 25th was attended by members who weathered a very severe cold and unpleasant evening and much credit is due them for facing such weather as Old Man Winter gave us for this meeting night.

Following the business meeting, a bunco party was held. Those in charge were Mrs. H. Klepfer and Mrs. R. M. Duncan. The prizes were donated by members, and were greatly appreciated and enjoyed by the winners.

We are looking forward to many more pleasant evenings together.

PITTSBURGH LADIES' AUXILIARY

By MRS. V. C. WAIGHT, *Secretary*
192—49th St., Pittsburgh, Pa.

THE meeting was held at the home of Mrs. H. S. McCloud, with President Mrs. F. V. Golitz presiding. Mrs. V. C. Waight was elected secretary and was instructed to send the minutes of the preceding meetings to the National Secretary's office for publication in the Official Organ. There were ten ladies present, and an effort is being made to secure a larger attendance.

The hostess served a Valentine luncheon for the members and their husbands. Mr. John Kirch in his anxiety to join his wife, locked himself out of his car. With the aid of Mr. McCloud's coat hanger and necktie the door was finally opened. The next meeting will be held at the home of Mrs. John Kirch, 801 Fisher Street, South Hills.

CENTRAL NEW YORK CHAPTER

Meeting of January 24, 1938
By M. H. SCHWARTZBERG, *Secretary*
512 E. Taylor St., Syracuse, N. Y.

THE meeting was called to order by President Harold Persett at the Syracuse Supply Co., 314 W. Fayette St., Syracuse.

Mr. Thomas Phillips of 40 West 40th St., New York City, who is connected with the Detroit Lubricator Company and who had made a special trip to this meeting, was introduced to the members. He gave a very interesting talk on his equipment; also told how to install and what to look for if installed incorrectly. Each of the items made by his firm was thoroughly discussed so every member understood the characteristics and applications of same.

An announcement was made of the coming banquet that will be held at the Green Gate Inn at Fairmount Corners, Saturday,

WE are ready for the Spring rush. Prompt shipments are assured by our large stocks. Look over our latest catalog which shows new items and new low prices. All parts, supplies, tools and equipment for refrigeration and air conditioning.

THE HARRY ALTER CO.

1728 So. Michigan Avenue, Chicago, Ill.

February 26th, for members and their wives or sweethearts.

A rising vote of thanks was given to the Syracuse Supply Co., the Syracuse Equipment Co. and Graybar for the able manner in which the meeting was put over.

Meeting of February 21, 1938

Reports of the various officers and committees were read. The Educational Committee, consisting of Messrs. S. Nyswonger and R. Coonradt, reported that the meeting date of March 14th is engaged by the Dayton Rubber Mfg. Company representatives, while March 28th is for the return trip of Mr. T. Phillips of the Detroit Lubricator Co. The Committee was instructed to contact Mr. Judli of the Carrier Corporation for a speaker from that company.

Mr. J. W. Stevens was then introduced to tell his message to the members regarding the products made by Minneapolis-Honeywell, which was very interesting, and a rising vote of thanks was given for the able manner in which he put his talk over.

DAYTON CHAPTER

Meeting of February 2, 1938

By **G. O. SNYDER**, *Secretary*
R.R. 5, Box 224, Dayton, Ohio

THE meeting was called to order by President E. O. Bowman.

Mr. T. C. Bickel presented a pep talk, and also outlined a few points of our organization in behalf of the large number of visitors present. In conclusion, Mr. Bickel presented Mr. Paul Domke, a special representative of the Mueller Brass Company of Port Huron, Michigan.

Mr. Domke displayed a large variety of valves, fittings and accessories for refrigeration work. He demonstrated the soldered joint system, which was very interesting to all.

TRI-STATE CHAPTER

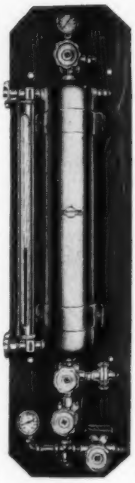
Meeting of February 7, 1938

By **A. W. ALBERTSEN**, *Secretary*
206 W. Eighth Ave., Huntington, W. Va.

THE meeting was called to order by President Claude Brunton.

Mr. Brunton introduced Mr. C. O. McCauley of Pittsburgh, a member of the Board of Directors of the National Society, and turned the meeting over to him.

After reading the objects of the Society, Mr. McCauley proceeded to very ably and impressively administer the obligation to the officers and members present and on behalf



SAVE TIME . . . LABOR
EXPENSIVE
REFRIGERANT
With the NEW
KEROTEST
REFRIGERANT
CHARGING STANDS

No refrigeration service shop is really complete without the efficient services of the Kerotest Refrigerant Charging Stand. One filling of this unique Charging Stand permits you to charge a number of refrigeration units or service drums in a minimum of time and lost motion. Moreover, it is unnecessary to weigh and reweigh small service drums during filling to ascertain weight of refrigerant contained therein.

As the whole unit is furnished complete, securely mounted on an oak stained panel board, not over 5 minutes set-up time is required to install the unit in your plant. Absolute safety is assured by an automatic spring loaded safety device set to release at approximately 375 lbs. pressure which may be tubed to the open air.

These Charging Stands are available in two sizes—Type 470 having a liquid capacity of 11½ lbs. Sulphur Dioxide and the new Type 471 having a capacity of 36½ lbs. — large enough to receive the entire contents of a 35 lb. SO_2 drum. Ask your local jobber about the remarkable advantages of this new Kerotest unit.

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PITTSBURGH, PA.

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FORGED BRASS PRODUCTS

Phone your nearest distributor

JOBBERS WITH LOCAL STOCKS

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Allentown, Pa. .. General Refrigeration Supply Co.
Atlanta, Ga. .. J. M. Tull Metal & Supply Co., Inc.
Atlanta, Ga. .. Bowen Refrigeration Supplies, Inc.
Baltimore, Md. ..... Clendenin Bros., Inc.
Baltimore, Md. .. Melchior, Armstrong, Dessau Co.
Binghamton, N. Y. .. Syracuse Equipment Corp.
Boston, Mass. ..... A. E. Borden Co.
Bridgeport, Conn. ..... Parsons Bros.
Brooklyn, N. Y. .....
..... Coleman Electrical Supply Co., Inc.
Brooklyn, N.Y. . Melchior, Armstrong, Dessau Co.
Brooklyn, N. Y. ..... The Capson Co.
Buffalo, N. Y. ..... Root, Neal & Co.
Cambridge, Mass. .....
..... Melchior, Armstrong, Dessau Co.
Charlotte, N. C. ..... Henry V. Dick Co.
Chattanooga, Tenn. ..... Noland Co., Inc.
Chicago, Ill. ..... H. W. Blythe Co.
Chicago, Ill. .. Borg-Warner Service Parts Co.
Chicago, Ill. ..... Fred C. Kramer Co.
Chicago, Ill. ..... H. Channon Co.
Chicago, Ill. .....
..... Automatic Heating & Cooling Supply Co.
Chicago, Ill. ..... The Harry Alter Co., Inc.
Chicago, Ill. ..... Airo Supply Co.
Cincinnati, Ohio ..... The Merkel Bros. Co.
Cincinnati, Ohio ..... Williams & Co., Inc.
Cleveland, Ohio ..... The Harry Alter Co., Inc.
Cleveland, Ohio ..... Williams & Co., Inc.
Columbus, Ohio ..... The Justus & Parker Co.
Dallas, Texas ..... The Electromotive Co.
Davenport, Iowa ..... Republic Electric Co.
Dayton, Ohio ..... The W. H. Kiefaber Co.
Denver, Colo. ..... Auto Equipment Co.
Detroit, Mich. ..... J. M. Oberc, Inc.
Detroit, Mich. .. Borg-Warner Service Parts Co.
Flint, Mich. ..... Shand Radio Specialties
Fort Wayne, Ind. ..... H. J. Schroeder Co.
Ft. Worth, Tex. .....
..... McKinley Refrigeration Supply Co.
Greensboro, N. C. ..... Hasco, Inc.
Harrisburg, Pa. .....
..... Melchior, Armstrong, Dessau Co.
Hartford, Conn. .. Marsden & Wasserman, Inc.
Hempstead, Long Island, N. Y. Sid Harvey, Inc.
Honolulu, T. H. .. Theo. H. Davies & Co., Ltd.
Houston, Tex. .. Standard Brass & Mfg. Co.
Houston, Tex. .. Walter Refrigeration Supply Co.
Indianapolis, Ind. ..... F. H. Langsenkamp Co.
Jackson, Miss. ..... Enochs Sales Co.
Jacksonville, Fla. ..... Jamita Company
Kansas City, Mo. .....
..... Forslund Pump & Machinery Co.
Knoxville, Tenn. ..... Leinart Engineering Co.
London, Ont., Canada .....
..... Refrigeration Supplies Co., Ltd.
Long Beach, Calif. ..... L. B. Marsh
Los Angeles, Calif. .. Refrigeration Service, Inc.
Los Angeles, Calif. . Refrigeration Parts Exchange
Louisville, Ky. .. Louisville Mill Supply Co., Inc.
Lubbock, Tex. . R. & R. Parts & Supply Co., Inc.
Macon, Ga. ..... Lowe Electric Co.
Madison, Wis. ..... Gustave A. Larson Co.
Memphis, Tenn. .. United Refrigerator Supply Co.
Miami, Fla. ..... Railey-Milam, Inc.
Milwaukee, Wis. . Chase Brass & Copper Co., Inc.
Milwaukee, Wis. ..... Refrigeration Specialty Co.
Minneapolis, Minn. .....
.. Refrigeration & Industrial Supply Co., Inc.
Montreal, Quebec, Canada .....
..... Railway & Engineering Specialties, Ltd.
Mt. Vernon, N. Y. .....
..... County Seat Plumbing Supply Co.
Newark, N. J. ..... T. W. Binder Co.
New Orleans, La. ..... Enochs Sales Co.
New Orleans, La. ..... The Spangler Co.
New York, N. Y. ..... Aetna Supply Co.
New York, N. Y. .....
..... Melchior, Armstrong, Dessau Co., Inc.
New York, N.Y. . Paramount Electrical Supply Co.
New York, N. Y. ..... The Harry Alter Co., Inc.
Norfolk, Va. ..... Noland Co., Inc.
Oakland, Calif. ..... Pacific Tool & Supply Co.
Oklahoma City, Okla. ..... Mideke Supply Co.
Omaha, Nebraska ..... United Supply Co.
Paterson, N. J. ..... White & Shauger, Inc.
Peoria, Ill. ..... Wilkins Pipe & Supply Co.
Pittsburgh, Pa. ..... Williams & Co., Inc.
Philadelphia, Pa. .....
..... Melchior, Armstrong, Dessau Co., Inc.
Philadelphia, Pa. ..... Victor Sales Corporation
Phoenix, Ariz. . Refrigeration Supplies Distributor
Portland, Ore. ..... Bill Hieber, 526 S. E. Wash.
Providence, R. I. .....
..... Rhode Island Supply & Eng. Co.
Rochester, N. Y. ..... Ontario Metal Supply, Inc.
Rochester, N. Y. .....
..... Melchior, Armstrong, Dessau Co., Inc.
Rockford, Ill. ..... Gustave A. Larson Co.
Sacramento, Calif. ..... Hinshaw Supply Co.
Scranton, Pa. ..... Central Service Supply Co
St. Joseph, Mo. ..... Bristol Supply Co.
St. Louis, Mo. ..... The Harry Alter Co., Inc.
St. Louis, Mo. ..... The Spangler Co.
Salt Lake City, Utah ..... Peerless Utah Co.
San Antonio, Texas ..... Straus-Frank Co.
San Francisco, Calif. . California Refrigerator Co.
San Juan, Puerto Rico . Refrigeration Supply Co.
Seattle, Wash. ..... Refrigerative Supply, Inc.
Sioux City, Iowa . National Refrigeration Service
South Bend, Ind. ... The South Bend Supply Co.
South Bend, Ind. ..... F. H. Langsenkamp Co.
Springfield, Ill. ..... United States Electric Co.
Springfield, Mass. ..... C. P. Payson Co.
Syracuse, N. Y. . Syracuse Equipment Corporation
Toledo, Ohio . The Heat & Power Engineering Co.
Toronto, Ontario, Canada .....
..... Railway & Engineering Specialties, Ltd.
Tulsa, Okla. ..... Machine Tool & Supply Co.
Vancouver, B. C., Canada ..... Fleck Bros., Ltd
Washington, D. C. ..... Refrigeration Supply Co.
Waterloo, Iowa ..... Winterbottom Supply Co.
White Plains, N. Y. .....
..... County Seat Plumbing Supply Co., Inc.
Wilkes Barre, Pa. ..... Radio Service Co.
Winnipeg, Manitoba, Canada .....
..... Railway & Engineering Specialties, Ltd.
Worcester, Mass. ..... Standard Supply Co.

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of the National Society welcomed Tri-State Chapter as a part of the National Society and presented President Brunton with the charter for Tri-State Chapter No. 1.

President Brunton, on behalf of the members and himself, thanked Mr. McCauley and the National Society for granting our petition for a charter and assured him of the cooperation of all members of the chapter.

Mr. McCauley then presented the members present with their membership cards and certificates and turned the meeting over to President Brunton.

Taking advantage of Mr. McCauley's presence, President Brunton asked the members if they had any questions they would like to ask him and that if they did Mr. McCauley would probably be glad to answer them. Mr. McCauley agreed, and several questions were asked, which he very kindly explained.

Mr. McCauley also gave a short talk on present and future air conditioning problems explaining the difference between the present room cooling and the ideal air conditioning job of the future.

In addition to Mr. McCauley, we had the pleasure of having with us as visitors Mr. A. Goloar, who had accompanied Mr. McCauley on this trip from Pittsburgh, Mr. Roy McElhaney of the Mechanical Refrigeration Supply Company, and Mr. Hans Daniels of Ashland, Kentucky.

Meeting of February 21, 1938

Due to the speaker of the evening having an engagement which made it necessary for him to leave early, President Brunton turned the meeting over to Mr. M. E. Harrison, who introduced Mr. Scott of the Kentucky and West Virginia Power Co., who gave a fine talk on the problems encountered in placing large installations in certain localities without first consulting the utilities company regarding the power available at that particular location. Mr. Scott was followed by Mr. Cassidy, also from the power company, who gave some details regarding a large installation with which they were having some trouble at the time. Both gentlemen advised the men present that they, their salesmen and sales engineers should consult the utilities company before ordering any equipment, particularly large motors for air conditioning.

Mr. Harrison also introduced Mr. Norton, sales representative of the Hussman Company in this territory.

The meeting was turned back to President Brunton, who thanked Mr. Scott and Mr. Cassidy for their talks.

The President asked the members to make suggestions regarding the program for our meetings, and tell just what they would like to have in the way of educational features. Among other suggestions, Mr. Cottle suggested that at each meeting some member take the unit with which he is most familiar and describe it for the benefit of those present. This suggestion met with the approval of the members present and will be started at an early meeting.

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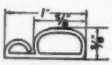

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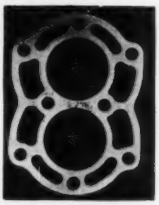

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KANSAS CITY CHAPTER

Meeting of January 25, 1938

By S. A. LEITNER, *Secretary*
3112 Holmes St., Kansas City, Mo.

THE meeting was called to order by President T. L. Anderson at 9 P. M.

After the regular business of the meeting had been dispensed with, the annual banquet plans were presented by the Entertainment Committee and discussed. President Anderson suggested that the Committee make final arrangements and present same at the next meeting.

Mr. R. E. Parks and Mr. E. W. Newcomer, both members-at-large, were present at the meeting and were asked to make a few remarks. Because of Mr. Parks' connection with a large concern and a varied experience in selling and servicing, he was able to present to the members some very interesting suggestions and advice, to help overcome some of the difficulties this chapter is experiencing in regard to membership. He stressed that we should consider quality, rather than quantity in our membership.

Meeting of February 8, 1938

Vice-President H. F. Andrews called the meeting to order in the absence of President Anderson.

Mr. R. E. Clemenson suggested that the Educational Committee get in touch with the jobbers and have them show and talk about any new products, that are now on the market, as an additional educational feature. This remark was accepted as a very good one and the Educational Committee instructed to work along the lines suggested. Mr. Ray Ryan suggested that members bring bulletins on refrigerating equipment for reading and discussion; also any information that has been gained through experience, that might interest other members. This suggestion was referred to the Educational Committee to work out with their other educational programs.

The meeting was then turned over to Mr. DeWilde, chairman of the Educational Committee for the discussion of lessons one and two of the Lecture Course. A list of questions and answers was prepared by the Chairman, and in this form presented. This part of the meeting proved very interesting and will be followed in the future, because of the interest displayed.

Meeting of February 22, 1938

Immediately after the meeting was called to order by Vice-President J. DeWilde, it was turned over to the educational chairman, who introduced Mr. N. S. Payne of the Thompson Hayward Company, who in turn presented "The Wonder World of Chemistry"—a sound picture—to the delight of every one present. Mr. Payne was thanked for his interest in our meeting and was asked to return in the near future.

The final banquet announcements were made by Mr. H. L. Green, who predicted a large turnout and a good time for all.

Mr. E. L. Tramposh was asked to investigate the possiblity of obtaining the post

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card machine for meeting notices, which the chapter owns jointly with the Forslund Pump and Machinery Co. and to purchase same for our exclusive use.

An evening is to be set aside in the very near future for the certificate examination, inasmuch as a number of members have indicated their desire to take this examination.

The question and answer session conducted by the Educational Committee received a very favorable reponse.

The Educational Chairman assigned the following subjects, to be discussed at the next meeting: H. L. Green on the "Service Analyzer" by D. D. Wile; F. A. Thompson on "A New Type Beer Cooler"; L. H. Roberts, "New Mechanical Devices"; S. A. Leitner, "R.S.E.S. Chapter News." All of these subjects appear in the January issue of the Official Organ.

\$ \$ \$

MISSISSIPPI VALLEY CHAPTER

Meeting of January 28, 1938

By E. L. BENGSTON, *Secretary*
116 E. First St., Davenport, Iowa

THE regular meeting of January 28th was opened by President L. Nelson.

Secretary Bengston announced that Mr. Ned Jennison, engineer from the Penn Electric Switch Company of Goshen, Indiana, would be the speaker at the next meeting which is to be held on February 11th.

A discussion followed regarding the different selling prices of refrigerant gases and the price which should be charged for changing domestic seals on condensing units as well as the price per hour which members of the Mississippi Valley Chapter should charge for their labor. Mr. Lonnie Fish made the motion, which was seconded by Mr. John Sackey, that a suggested chart of prices be worked out and presented to the members of the chapter at the second meeting in February.

Meeting of February 11, 1938

This regular meeting of the chapter was held at the Republic Electric Company building on Friday evening, February 11th. Roll call was taken by Sergeant-at-arms, John Ven Horst.

President Leonard Nelson advised the members that the Republic Electric Company was holding its annual convention on February 25th, which was the next regular meeting night of the Chapter, and that plans could be made to have an exhibit or booth at this meeting. Mr. O. Balke was made chairman of the Booth Committee, and the

members selected to serve on this committee are as follows: E. Dick, F. Tindall, C. Kaufman, D. S. Brainard, L. Fish, E. Ford.

The educational speaker of the evening was Mr. Ned Jennison of the Penn Electric Switch Company and he had with him a display board rigged up with push buttons so that the switches could be operated. Mr. Jennison's talk was very interesting and each person present was pleased with the program.

CHICAGO CHAPTER

Meeting of February 22, 1938

By H. J. LONG, *Secretary*
5623 S. Ada St., Chicago, Ill.

THE meeting was called to order by President F. H. Roth at 8:15 P.M.

The Entertainment Committee gave a report on the smoker to be held March 18th at the Auditorium Hotel. The Housing Committee reported on the progress being made on the new meeting place.

Mr. R. Vanston called on Mr. M. W. Knight of Peerless of America, Inc., who spoke a few words, and then called on Mr. A. F. Hoesel, chief engineer of Peerless. Mr. Hoesel would not speak until four smoker tickets were sold. He then proceeded with his talk on the new Spine Coil designed by him for Peerless and told of its many and varied uses and advantages in heating as well as in refrigeration. He answered a number of questions presented to him from the floor in a very clear and concise manner. This was followed by a reel of motion pictures by Mr. Knight depicting the construction of the many and varied products of the Peerless Chicago factory.

Tickets were handed out for a raffle of a free membership donated by Mr. Vanston of the Educational Committee, for a lucky number in attendance at the meeting. Mr. E. W. Scotten was the lucky fellow.

PITTSBURGH CHAPTER

Meeting of February 11, 1938

By F. V. GOLITZ, *Secretary*
1109 Pemberton St., Pittsburgh, Pa.

ABOUT forty members and visitors were present at this meeting, which was held at the Commonwealth Building at 816 Fourth Avenue. As the chapter is planning on holding two meetings a month instead of only one, Secretary Golitz reported on the progress that has been made in locating a meeting place for this second meeting.

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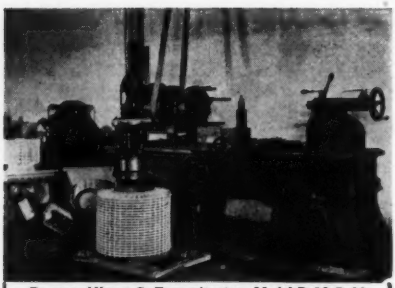

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A motion was made and passed that the men appoint a committee to make arrangements for a central meeting place for the ladies.

President E. V. Black turned the meeting over to Mr. N. D. Wagener, chairman of the Educational Committee. An outline of the subject scheduled for discussion was distributed to the members and the subject "Blower Coils" was thoroughly covered by Mr. Wagener. A discussion of service problems followed. At the conclusion of the discussion, Mr. Black thanked Mr. Wagener for his fine presentation.

Mr. D. R. Koontz appointed H. A. Biber and N. D. Wagener to the Membership Committee, of which he is chairman.

A Tour of the A & P Warehouse

Friday, January 14th, 1938, the Pittsburgh Chapter made an inspection tour of the Produce Warehouse of the Great Atlantic & Pacific Tea Company, 43rd Street and A. V. R. R., Pittsburgh, Penn.

Interest centered chiefly around the air conditioned banana ripening rooms; ten in number, capable of holding 190 tons, or approximately 5,500 bunches at one time—this is equivalent to the season's yield from a twenty acre section of land.

The bananas are ripened in three stages. About twenty-four hours are required for each stage.

First: Green bananas are removed from the cars, and are hung in the rooms three tiers high. Temperature 70 degrees F. and Relative Humidity 95 percent. Second: Rooms are ethylene gased to assist ripening when fruit is thin or not uniform. During this stage the starch in the fruit begins to change to sugar and the color changes from dark green to pale yellow. Carbon dioxide and heat are generated by the ripening fruit. Temperature 68 degrees F. Relative Hum. 85 percent. Third: Holding and Hardening. The fruit is now ripened to the proper degree for cutting and packing. By decreasing the temperature and humidity, ripening is retarded and the fruit is given a firmness of body which makes it possible to handle without bruising. Temperature 58 degrees F. to 64 degrees F. Relative Humidity 75 percent to 80 percent.

When ripening has been completed, the hands are cut from the stalk and packed in special boxes. Each box holds forty pounds. Damage to the fruit from heat, cold, or handling is prevented by the use of shredded paper on the bottom, sides, and ends of boxes, and sheets of paper between the hands.

Spray type air conditioners located in each room are used to give the proper temperatures and humidities. For securing the cor-

rect dewpoint, the water spray is either heated by steam or cooled by a refrigerated coil. A steam coil located in the top of the air conditioner and an automatic by-pass damper give the proper heat. Air is circulated by a direct connected motor driven centrifugal fan located in the top of the air conditioner.

The refrigerating load varies from 10 to 20 tons, depending upon the quantity of fruit being handled, the outside temperature, and ripened stage of the fruit. Temperatures and humidities are automatically controlled by wet bulb thermostats, dry bulb thermostats, steam valves and damper valves.

Here are a few other items of interest to the layman:

Bananas mostly come from Honduras. New stalk must be planted each season. Sprouts must be protected from excessive floods and surface slime during rainy season. Bunches must be cut down and transported to seaport. Refrigerated boats carry them to our seaports. Loaded and shipped inland in refrigerator cars which are heated in the winter and cooled in the summer. 50 degrees will freeze a banana, while 76 degrees will cook it. Either extreme ruins the fruit. Unloaded at destination and stored in ripening rooms. Ripened, removed from rooms and cut from stems, packed and distributed to stores, then sold to you at the fruit stand.

While bananas may rightfully be considered as a highly perishable fruit, yet so thoroughly have all details been worked out in connection with the growing, transportation, ripening, and distribution of the banana that this delectable dainty can be served to you all the year around by your grocer at approximately the price per pound as you pay for apples, sweet potatoes or other fruits and vegetables grown in your own state.

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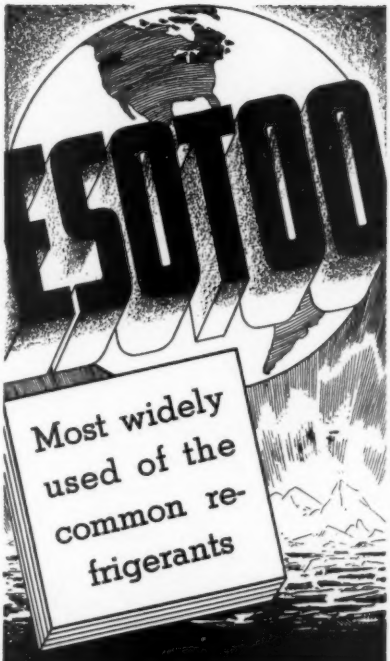
CLEVELAND CHAPTER

Meeting of February 10, 1938

By R. D. CHOWN, *Secretary*
14102 Parkdale Ave., Cleveland, Ohio

THE following officers were elected at our meeting held at the Sterling Hotel on February 10th: W. E. Wright, *president;* Lawrence Gardella, *1st vice-president;* W. Meder, *2nd vice-president;* R. D. Chown, *secretary;* Karl L. Debes, *treasurer;* Emil Flanik, *sergeant-at-arms; Board of Directors:* G. Schuld, W. W. Farr, R. McCloskey, C. Husted, E. Vadakin.

Two visitors were present. It was decided to hold meetings regularly on the second and fourth Thursdays of each month. A lively discussion was carried on bringing out many good suggestions to revive interest among the members, so as to increase the attendance and membership.



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At the February 24th meeting, Mr. Anderson of the Automatic Products Co., assisted by Mr. Bolds, gave a very interesting talk on manufacture, construction and operation of A-P thermostatic expansion valves and solenoid valves.

Mr. James H. Downs was elected chairman of the Educational Committee.

TRI-COUNTY CHAPTER

Meeting of February 14, 1938

By **WILLIS STAFFORD**, *Secretary*
726 Hinman St., Aurora, Ill.

THE meeting was called to order by President E. White at 8:30 P.M., and was immediately turned over to the Educational Committee.

Mr. H. Burgess introduced Mr. C. F. Mohr of the Durabilt Locker Company. Mr. Mohr told us a very interesting story about the new cold storage locker plants that are being built all over the country. The next speaker was Mr. Hill of the Dole Plate Company. Mr. Hill told about the application of Dole plates to these cold storage locker plants, and other uses of their product. This concluded the educational program.

The minutes of the last meeting were approved as read, and Mr. W. Metcalf gave a report of the Entertainment Committee on the smoker which will be held at the Log Cabin in Aurora on February 23d. The program is completed and tickets have been distributed to the members.

The educational program for our March meeting was announced. We will have a speaker on the application of molded firebrick in oil burner combustion chambers, and a speaker from Minneapolis-Honeywell on controls.

MISSOURI VALLEY CHAPTER

Meeting of January 27, 1938

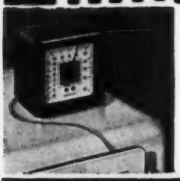
By **P. O. JONES**, *Secretary*
207 N. 16th St., Omaha, Nebr.

MR. AUSTIN JONES, chairman of the Educational Committee, introduced the guest speaker of the evening, Mr. Harry Ashcraft, service manager of the Major Appliance Co. Mr. Ashcraft used as his subject, "Multiple Systems."

At the completion of Mr. Ashcraft's interesting talk, he answered the many questions of the members.

A motion was made that the chapter dis-

MARSH Refrigeration Instruments



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continue the special meetings and cut the business of the regular meetings to allow time for educational programs at each meeting.

Meeting of February 3, 1938

President C. J. Doyle called the meeting to order. After various officers' reports, six new members of the chapter were given the R.S.E.S. oath.

Mr. T. R. Cherry was called on to give a report, as chairman of the Public Relations Committee. Mr. Cherry introduced Mr. G. M. Sebree, a member of his committee, who explained to the members the necessity of a code in Omaha, and said that the Air Conditioning Council and Mr. Browne, the city engineer, are now working on the matter. Mr. Sebree suggested that the chapter wait until a copy of the code from the American Manufacturers' Association is received by the Air Conditioning Council before they do any definite work, and at that time to work with the Air Conditioning Council.

Mr. Doyle appointed a committee of six to work out the code with the Public Relations Committee. The new committee consists of Mr. F. Haeberlein, Stanley Welna, O. Larson, G. Lozier, E. Lewis and R. L. Hendrickson.

President Doyle read a letter from Mr. E. C. Hamilton, resigning as sergeant-at-arms and chairman of the Investigating Committee, due to his absence from the city. President Doyle appointed Gordon Lozier as sergeant-at-arms and as chairman of the Investigating Committee.

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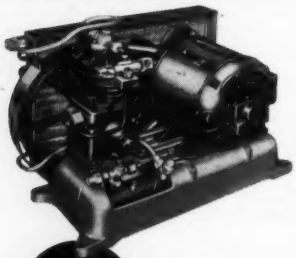

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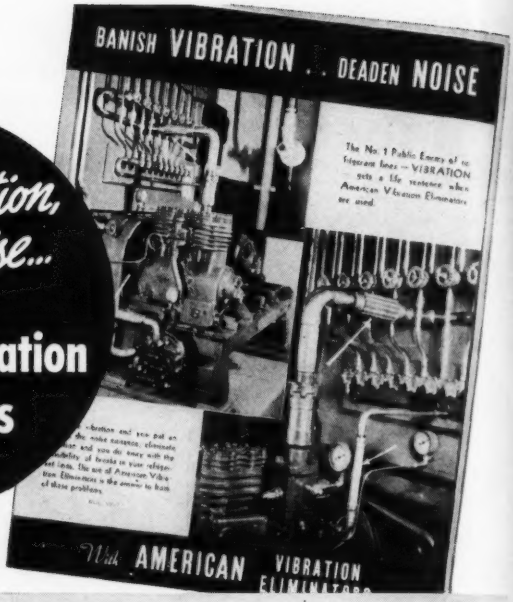
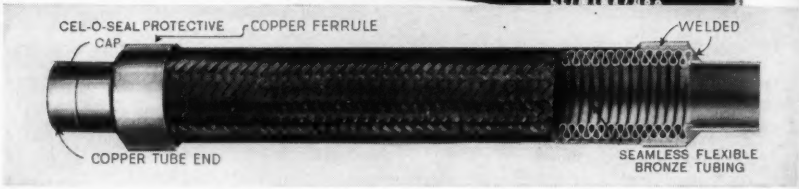


Write for your free copy of the new Bulletin VE-2 on American *Seamless* Vibration Eliminators.



AMERICAN Vibration Eliminators consist of a section of *Seamless* Flexible Bronze Tubing covered with bronze wire braid. Standard copper tube "slip fittings" are welded on to each end. These eliminators are your most *foolproof* solution to the noise and vibration problem which often results in cracked pipes, refrigerant leakage, and other expensive repairs. *They are absolutely leakproof.*

American *Seamless* Vibration Eliminators are designed to be installed easily by any service man. Manufactured in various sizes and lengths to fit any standard size of copper tube or solder fitting. American *Seamless* Vibration Eliminators come to you thoroughly cleaned, dried out and sealed with air-tight, moisture-proof caps. Write for Bulletin VE-2, shown above.

ANACONDA

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American Metal Hose Branch
General Offices: WATERBURY, CONNECTICUT

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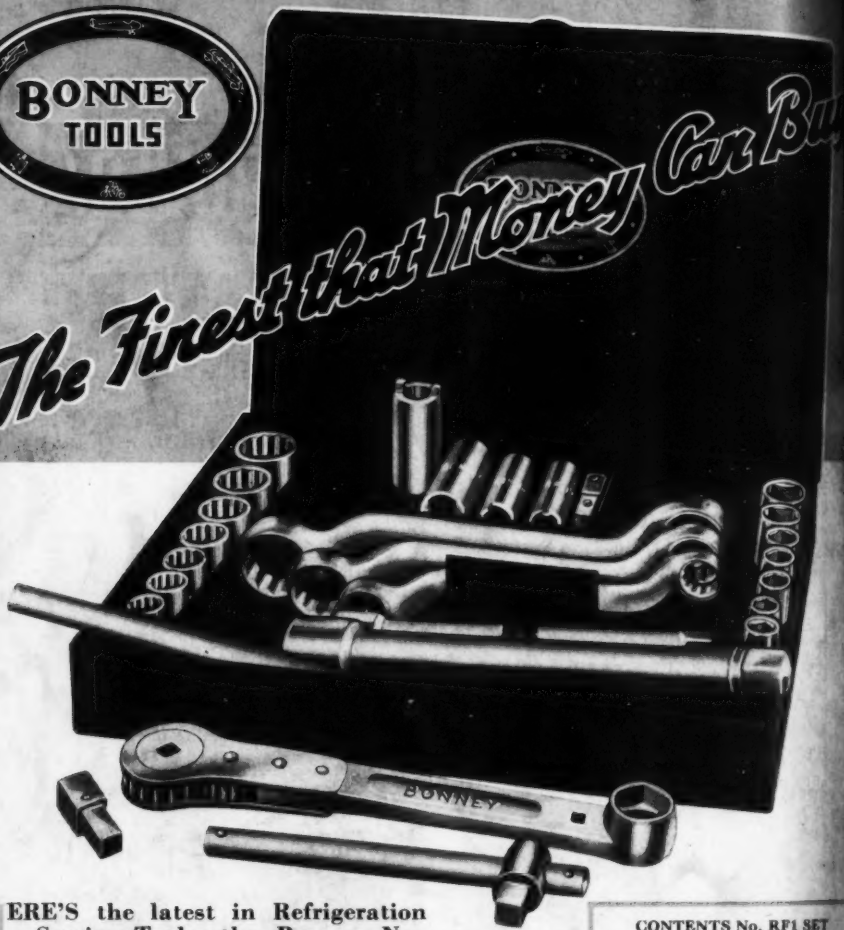

HERE'S the latest in Refrigeration Service Tools—the Bonney No. RF1 Set. Twenty-eight really necessary pieces that will answer practically all your regular nut turning problems—all in one convenient, compact metal case that measures only 7⅞" x 5¾" x 1⅛".

Included are the new Bonney Reversible Refrigeration Ratchet and 3 new thin wall Box Wrenches, designed especially for refrigeration service.

And it's reasonably priced—$12.75.

The No. RF1 Set is only one of many new items in the Bonney Line of Refrigeration Tools. Catalog No. 38R just off the press—shows the full line. Write for your copy today. It's the most complete refrigeration tool catalog ever offered.

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- 1 each 3/8"; 7/16" ¼", 5/16" 3/8" Valve Stem Sockets
- 3 Packing Gland Nut Sockets
- 1 Packing Nut Socket for Kerotest Valve
- 1 each ¼" x 9/16" and ¼" x ⅜" Ratchet Plug Adaptors
- 1 Sliding "T", 4" long
- 1 Extension, 4½" long
- 1 Extension, 6" long
- 1 Cross Handle for 6" Extension
- 1 Reversible Ratchet
- 3 Thin Wall Box Wrenches with double-hexagon openings from 3/8" to 11/16".

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